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ABSTRACT

An ultimate purpose of education is human resource development to provide society with a critical mass of intellectual capital and competent workforces. To accomplish this end, leaders implement planning processes to guide policy-making, develop institutions, and allocate resources. Although new information technologies are becoming commonplace in business and many homes, they remain largely unused in traditional education. Without access to the latest contemporary technology, learners are being shortchanged. Moreover, necessary skills such as collaboration and formation of strategic alliances are usually not encouraged in traditional education. Contemporary communication and information technologies can reengineer traditional education and create entirely new information-era learning communities. This paper discusses strategic planning and solution-based learning and suggests strategies for restructuring establishments, emphasizing learning readiness and math, science, and technology. The paper also includes organizational development and resources development tasks for learning communities to create superschools focusing on internationalized curricula and graphic communications. Included are an abstract; appendices providing information on effective establishments, visions, graphic arts technical foundation certification, child and youth studies, and creation of learning communities. Contains 189 references. (MLH)

ED 370 181

RESTRUCTURING FOR THE 90s AND BEYOND

Solution Based Learning in the Era of Smart Homes, Wired Communities, Fast Systems, Global Networks, and Fast Forward Learners in a Borderless World

by

Warren H. Groff
National Lecturer
Nova University

Education Technology Conference
New Jersey School Boards Association
February 26-27, 1994

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Restructuring for the 90s and Beyond: Solution Based Learning in the Era of Smart Homes, Wired Communities, Fast Systems, Global Networks, and Fast Forward Learners in a Borderless World

Presented at the
Educational Technology Conference
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Nova University

Between now and the year 2000, educators, community leaders, and policy makers in the United States will face challenges and make decisions that will determine the quality of life for a majority of Americans in the first half of the 21st century. An ultimate purpose of education is human resources development -- to provide society with the critical mass of intellectual capital and competent workforces to function culturally, socially, economically, technologically, and politically in the world of which they are a part. To accomplish that ultimate purpose, leaders implement planning processes to (a) guide policy-making, (b) develop institutions, and (c) allocate resources.

People are surrounded with technologies, undreamed of a generation ago, which make it possible to transmit data, voice, and video instantaneously almost anywhere in the world and simultaneously in several different languages. Although these technologies are becoming commonplace in business and are sometimes available to children in homes, they remain largely unused in traditional education. Without access to the latest contemporary technology, a learner is receiving less than a complete education. In addition, global competitiveness is providing impetus for collaboration and strategic alliances, competencies and skills usually not encouraged in traditional education.

Contemporary communication and information technologies hold the potential for (a) re-engineering traditional education and (b) creating entirely new info era learning communities. This paper discusses strategic planning and solution-based learning and then suggests strategies for restructuring establishments with particular emphasis on (a) readiness to learn and (b) math, science, and technology. The paper includes organizational development and human resources development tasks for learning communities to create superschools with a focus on internationalization of the curriculum and on graphic communications.

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D. Child and Youth Studies

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STRATEGIC PLANNING

Strategic planning is a "know-how" process technology for designing and shaping the future, not merely adjusting to circumstances. Strategic planning is intended to help create conceptual frameworks through the three step process of (a) analysis, (b) visioning, and (c) action plan development. Strategic planning is both a science and an art. The science of strategic planning consists of (a) contextual analyses of internal and external environments; (b) creation of visions and alternative scenarios; (c) specification of a preferred scenario with strategic directions and a multi-year action plan; and (d) the acquisition and allocation of resources based on the plan. The art of strategic planning includes broad based empowerment of all stakeholders in transformational learning experiences intended to create a community capable of self renewal (see Attachment 1a). The process is based on beliefs, principles and values for improved quality of life.

Contextual Analyses

The contextual analyses consist of an internal audit of mission, primary programs, support programs, organization structure, resource allocation, etc. The mission statement should be a clear, concise statement of the business of the establishment. Only a very few stakeholders have ever participated in creating or even reviewing a mission statement. A clear mission statement is necessary, but insufficient to meet today's needs. A vision statement is needed to communicate where the business is going.

Primary programs consist of curricula or tracks which lead to certificates, diploma, degrees, or other formal recognition of completetion of a planned program of study. American secondary schools tend to have academic, general and vocational-technical tracks; colleges tend to have liberal arts, technical-occupational, continuing education, and community service and outreach programs and services. A curriculum consists of a content format, a delivery system format, and an evaluation format. Curricula often tend to be driven by a hard copy print-based textbook technology delivery system format or a "standardized test" evaluation format. Altering content in a hard copy traditional textbook or a standardized test, which is not standardized by any classical definition, takes a long time to change, and impacts on the interests of big business.

A critical component of the internal audit relates to an analysis of communication and information technologies. An information-based economic and social system will require more access to contemporary communication and information technologies in primary programs and support programs, with

particular emphasis on the library and media center with institutional research as a utility (Bolge, 1993).

The contextual analyses also consist of an assessment of demographic, social, economic, technological, and governmental planning variables that tend to be external to the establishment but which influence it in some way. Many educational institutions have analyzed demographic and social variables such as age, sex, ethnic background, per capita income, wealth, etc. These data are essential in planning programs, particularly to increase understanding of cultural diversity and uniqueness of the area economy. Although many institutions have improved the analysis of the external context as it relates to demographic and social variables, education must do more to analyze economic and technological variables and interpret the implications for curriculum with emphasis on synchronization with reality.

Global restructuring is occurring at a rate and on a scale such as the world has never expeienced. Transition from the agricultural era to the industrial era was based on simple technology and occurred over an extended period of time. Countries and institutions could adjust slowly. Transition from the industrial era to the post-industrial era was based on more complex technology and occurred in a short period of time. The transition the world is now experiencing from a post-industrial era to the early technical era is based on more complex technology and is occurring at a fast pace. The transition is based on technology undreamed of a generation ago. Most important, the transition from the early technical era to an advanced technical era (a) will involve the integration of technologies that are in the preliminary dreams of the most advanced thinkers and (b) will occur as a rate of change that is unparalleled in history.

Three dominant areas have emerged in the world (a) European Community, (b) North American Free Trade Agreement countries, and (c) Pacific Rim countries. The European Community (EC) is comprised of 12 countries with 350 million people and a per capita purchasing power greater than that of the U.S. The North American Free Trade Agreement (NAFTA) countries have approximately 320 million people. Pacific Rim countries have most of the world's people and have the most dynamic economies. The "economic miracle" by Taiwan is reflected in the increase in per capita income from 100 U.S. dollars in 1951 to $8,000 in 1990 (Groff, 1991a). Taiwan is now a major consumer of U.S. good and services. If the U.S. is to prosper in the 21st Century, it will have to cultivate off-shore markets by (a) becoming more sensitive to cultural diversity and (b) delivering goods and services of high quality at a competitive price that meet consumer needs and standards. How will the regions evolve and what are the implications for education (see Attachment 1b)?

STRATEGIC THINKING

INTERNAL

AUDIT

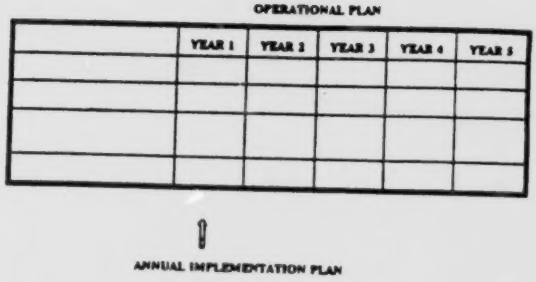
EXTERNAL

ASSESSMENT

VISIONS:
ALTERNATIVE
SCENARIOS

1. 21st CENTURY
2. 1990s - 2nd HALF

PREFERRED
SCENARIO



OPERATIONAL PLANNING

GLOBAL COMPETITIVENESS

	NOW	2000
GLOBAL REGION	EARLY TECHNICAL ERA	ADVANCED TECHNICAL ERA
EUROPEAN COMMUNITY		
NORTH & SOUTH AMERICA		
PACIFIC RIM		

Two categories of economic variables are important: establishments and jobs (workplaces and workforces).

The Census Bureau collects information about employment outlook using ten major categories, four of which are labeled goods (agriculture, mining, construction, and manufacturing) and six of which are services (finance, transportation and utilities, wholesale and retail trade, services, and non-classified). Each of the categories of establishments has many different types of businesses (see Attachment 2).

Three categories in manufacturing that are essential to the viability of the U.S. are #8 printing and publishing, #9 electric and electronic, and #19 instruments. Graphic communications are essential to everyone because of the relationship to literacy, productivity, and democracy. Commercial printing was the fourth largest manufacturing industry in 1992. Desktop electronic publishing is revolutionizing the printing and publishing industry.

Three categories of services that are essential to the viability of the U.S. are #7 health services, #9 educational services, and #10 social services. People need (a) to be physically and psychologically healthy, (b) to be lifelong learners, and (c) to benefit from social services. Major issues consist of (a) access, (b) quality, and (c) cost. During periods of rapid economic and social restructuring, dislocations will occur which will impact on children and families and even health establishments.

The Department of Labor classifies jobs using the Standard Industrial Classification (SIC) which parallels the classification of establishments (see Attachment 3). Some jobs are disappearing at a rapid rate, particularly in manufacturing establishments that will be automated or modernized with contemporary technology. Some jobs are increasing due to a variety of circumstances such as an aging population and health care needs. Most jobs are influenced by technology and require workers to retrain.

It is important to monitor research and development that causes advances in science and technology and patents, a formal recognition of an invention that begins a chain of developments. Adoption of new technology requires "just-in-time" human resources development training which is uniquely customized for the workforces in specific workplaces. Several states are accelerating the rate of technology generation, adoption, and transfer to modernize existing establishments and to create entrepreneurial enterprises. Design For The Eighties in South Carolina, the Ohio Technology Transfer Organization, and the Ben Franklin Partnerships in Pennsylvania are examples of state economic intervention strategies. Advances in technology that are

7A

ECONOMIC ESTABLISHMENTS

1. Agricultural services, forestry, fisheries
2. Mining
3. Contract construction
4. Manufacturing
5. Transportation & public utilities
6. Wholesale trade
7. Retail trade
8. Finance, insurance, real estate
9. Services
10. Non-classified

MANUFACTURING (#4) ESTABLISHMENTS

1. Food & Kindred Products
2. Tobacco
3. Textile Mill Products
4. Apparel & Other Textile Products
5. Lumber & Wood Products
6. Furniture & Fixtures
7. Paper & Allied Products
8. Printing & Publishing
9. Chemical & Allied Products
10. Petroleum & Coal Products
11. Rubber & Misc. Plastic Products
12. Leather & Leather Products
13. Stone, Clay & Glass Products
14. Primary Metal Industries
15. Fabricated Metal Products
16. Machinery, Except Electrical
17. Electric & Electronic Equipment
18. Transportation Equipment
19. Instruments & Related Products
20. Miscellaneous Manufacturing Industries
21. Administrative & Auxiliary

SERVICES (#9) ESTABLISHMENTS

1. Hotels & Lodging Places
2. Personnel Services
3. Business Services
4. Auto Repair Services
5. Miscellaneous Repair Services
6. Amusement & Recreational Services
7. Health Services
8. Legal Services
9. Educational Services
10. Social Services
11. Museums, Botanical, Zoological
12. Membership Organizations
13. Miscellaneous Services
14. Administrative & Auxiliary

STANDARD INDUSTRIAL CLASSIFICATIONS (SIC)

01-0	Agriculture
07	Agricultural services
08-09	Forestry and fishing
10-14	Mining
15-17	Construction
20-39	Manufacturing
40-49	Transportation, communications, & utilities
50-51	Wholesale trade
52-59	Retail trade
60-67	Finance, insurance, and real estate
70-89	Services
91-97	Public administration
99	Nonclassified

MANUFACTURING

20	Food & Kindred Products
21	Tobacco Manufacturing
22	Textile Mill Products
23	Apparel & Other Textile Products
24	Lumber & Wood Products
25	Furniture & Fixtures
26	Paper & Allied Products
27	Printing & Publishing
28	Chemicals & Allied Products
29	Petroleum & Coal
30	Rubber & Plastic
31	Leather & Leather Products
32	Stone, Clay, Glass, & Concrete Products
33	Primary Metal Industries
34	Fabricated Metal Products
35	Machinery, Except Electrical
36	Electrical & Electronic Equipment
37	Transportation Equipment
38	Instruments & Related Products
39	Miscellaneous Manufacturing Industries

SERVICES

70	Hotels, Rooming Houses, Camps, & Other Lodging Places
72	Personal Services
73	Business Services
75	Automotive Repair, Services, & Garages
76	Miscellaneous Repair Services
78	Motion Pictures
79	Amusement & Recreation Services, Except Motion Pictures
80	Health Services
81	Legal Services
82	Educational Services
821	Elementary & Secondary Schools
822	Colleges, Universities, Professional Schools, & Junior Colleges
83	Social Services (Census Only)
84	Noncommercial Museums, Art Galleries, Botanical & Zoological Gardens (Census Only)
86	Membership Organizations (The Census excludes 863, labor unions & similar organizations, 865, political organizations, & 866 religious organizations; the annual survey excludes SIC 86 entirely.)
89	Miscellaneous Services (Census Only)

tranfered into workplaces must become part of the student learning outcomes which are included in the curriculum to yield competent workforces. Consider the following technological advances:

In 1955, it was hand set type and the platen press.
In 1981, it was the PC.
In 1985, it was desktop publishing.
In 1989, it was voice activated technology and desktop presentations with sophisticated graphics.
In 1993, it was voice activated typewriters and electronic books.
In 1994, it will be desktop videoconferencing which minimizes geographic, physical and temporal restrictions.

Other technological advances are equally important. Franklin Publishing, Inc., in Mt Holly, NJ, is the leading electronic book publisher. On January 3, 1993, Franklin publishing announced the world's first personal digital assistant (PDA) -- the powerful Digital Book System (DBS-1). Each Digital Book has a capacity to store the equivalent of 10 Bibles through Franklin's data compression technology. The 4.6 ounce DBS-1 measures 3" x 5" x 1/2" and will operate up to one year of normal use on lithium batteries. Dictionary Plus dictionary and thesaurus contains over 300,000 definitions and 500,000 synonyms as well as core meanings and antonyms. The Language Master makes language more accessible for people who are blind, visually impaired, learning diabled, or speech impaired. Franklin is the world's largest publisher of electronic books, having sold more than six million books including English and bilingual dictionaries, Bibles, encyclopedias, entertainment, and educational and tutorial publications. Franklin's books are sold in 67 countries. More than 50 new titles were available in 1993 on subjects such as nutrition, foreign languages, business, travel, nursing, education, health, investment, and cooking. To industry watchers, the DBS represents an entirely new chapter in the publishing field that could change all reference books of the future.

Voice processing industries are perfecting inexpensive speech recognition remote control applications. Verbex Voice Systems, Inc., Edison, NJ, announced in January 1993 that Hill-Rom Company has developed a system using Verbex technology for controlling hospital room functions by voice. ENHANCEMATE provides functional control over a wide range of hospital room utilities. The head and knee sections of the bed can be raised and lowered. The Dynamic Sleep Surface of Hill-Rom's bed can be adjusted to the patient's comfort level from soft to firm. Reading lights can be turned on and off. The TV can be turned on and off and channels can be changed. Phone calls can be placed via voice through the unit's built-in-speaker phone. Hill-Rom Company is a wholly-owned subsidiary of Hillenbrand Industries and a $1.2 billion diversified international conglomerate.

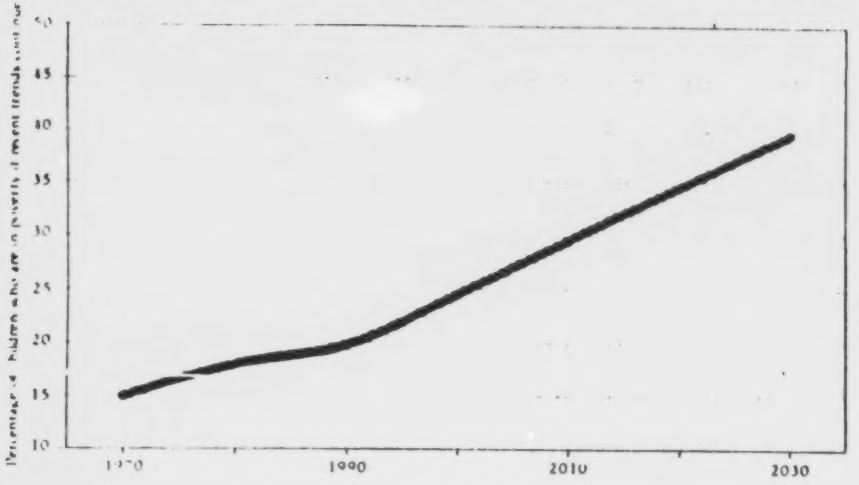
A critical component of the external audit relates to an analysis of the communication and information technology infrastructure. The critical significance of communication and information technologies can be seen in the increase of foreign exchange transactions from $10.3 billion a day in 1980 to $183.2 billion a day in 1989 (Wriston, 1992). Many businesses already use technologies that are several stages ahead of education and in some cases not even adequately introduced in the curriculum. Public libraries are an essential component of communication and information technology infrastructure; public libraries are a primary communications interface with the community.

A second critical component of the external audit relates to an analysis of the extent to which establishments are engaged in international commerce. What goods and services are currently delivered to off-shore consumers? Where? How are the goods and services modified for culturally diverse consumers? What goods and services are delivered within NAFTA that could be modified and delivered off-shore? U.S. citizens represent every culture in the world that can help establishments produce and deliver goods and services that are uniquely customized for other people.

The contextual analysis of historical and contemporary information yields insights about what exists -- THE REAL. This first stage analysis is necessary, but insufficient. The information must be extrapolated into the future. Demographic, social, economic, and technological variables must be projected into the future as accurately as possible to provide the "intelligence" necessary to determine policy and guide decision making. Extrapolation of demographic and social data trend lines to 2050 and the analysis of impact on children and youth has helped shape the "Leave No Child Behind" agenda of the Children's Defense Fund. Children and youth of color will be hardest hit during restructuring. The future of the U.S. is dependent, to a great extent, on the preparation of children and youth of color at the postsecondary level (see Attachment 4).

Several educational institutions modernized in the late 1970s and early 1980s with contemporary communication and information technologies (Groff, 1981, and Leslie, 1981). Case study analyses of "Third Wave" institutions provide valuable insights about the process of rethinking to modernize and revitalize human resources development systems. These and other case studies also provide insights about the process of rethinking for restructuring and revitalizing that is necessary to create the next generation of more responsive info era learning comunities (Groff, 1986b, and Leslie, 1986).

America's Children Are Getting Poorer While the Nation Gets Richer



Year	1970	1980	1990	2000	2020	2030
Percent	14.9%	17.9%	19.8%	24.5%	34.5%	39.6%

- In the year 2000, if recent trends continue, there will be 16 million poor children in the United States, 3 million more than in 1987. One in every four children will be poor.
- By the year 2030, there will be 25 million poor children. One in every three children will be poor.

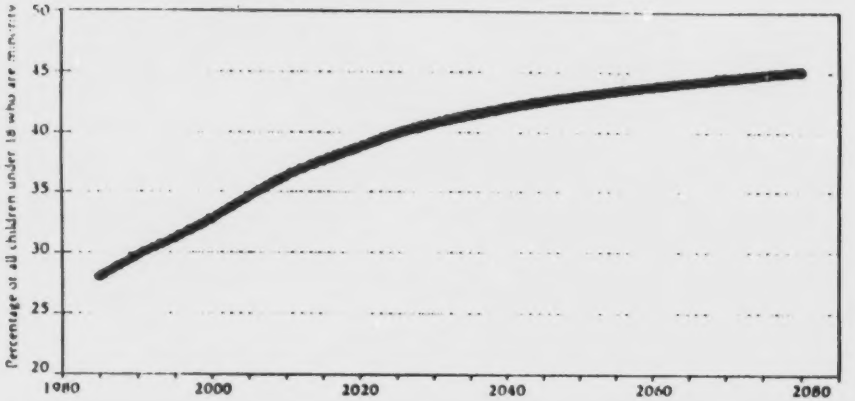
Source: CDF computations based on Census Bureau data.

Children and Young Adults Are Becoming Scarce Resources

Year	Total population (thousands)	Population under age 18 (thousands)	Percent of total population	Population 18-24 years (thousands)	Percent of total population
1985	238,631	62,838	26%	28,739	12%
1995	259,559	67,133	26%	23,702	9%
2000	267,955	67,389	25%	24,601	9%
2030	304,807	65,866	22%	26,226	9%

- The nation's young work force is shrinking. By 1995 there will be 5 million fewer 18- to 24-year-olds than there were in 1985.
- Although the actual number of children under age 18 will increase until the year 2000, the percentage of the population that is under 18 is decreasing. After 2000 the total number of children will begin decreasing as well.

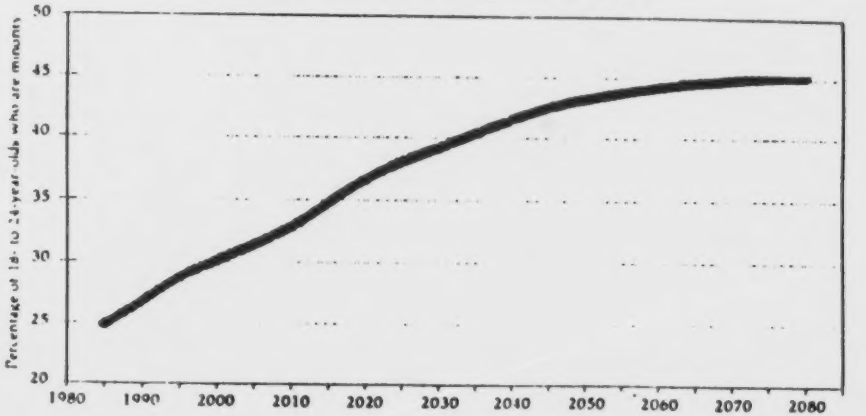
Minority Children in the United States



Year	1985	1990	1995	2000	2010	2020	2030	2050	2080
Percent	28.0%	29.7%	31.1%	32.7%	36.2%	38.7%	40.7%	43.0%	45.1%

Source: Based on Census Bureau projections.

Minorities in the Young Work Force



Year	1985	1990	1995	2000	2010	2020	2030	2050	2080
Percent	24.8%	26.7%	28.7%	30.1%	32.8%	36.6%	39.2%	43.2%	45.2%

- Nearly one-third of the nation's 18- to 24-year-olds will be minorities in 2000, compared with less than one-quarter in 1985.
- There will be 26 percent fewer white, non-Hispanic 18- to 24-year-olds in the year 2030 than there were in 1985.

Source: Based on Census Bureau projections.

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Creation of Visions and Alternative Scenarios

The purpose of the contextual analysis is to provide historical and contemporary information which can be extrapolated into the future and from which conceptual frameworks can be created for the next generation of alternative human resources development (HRD) systems.

Alternative forms of learning have been evolving over time. There have always been two primary forms of learning: (a) direct experience and (b) that which is transmitted from one member of a species to another via communications. Alternative education made considerable advances with the invention of movable type, telegraph, mail, telephone, television, telecommunicatoins, etc. With these advances, it was possible to expand the form, number, and range of alternatives for learning.

Visioning and scenario development has evolved over the past several decades. During the 1960s and 1970s most of whatever energy was devoted to strategic planning assumed the continuation of contemporary traditional education as the dominant means of human resources development. Visions were based on a number of internal and external demographic, social, economic, technological and governmental planning variables and scenarios that were developed could be classified as (a) expansion, (b) steady state, or (c) contraction based on the mix of above-mentioned variables.

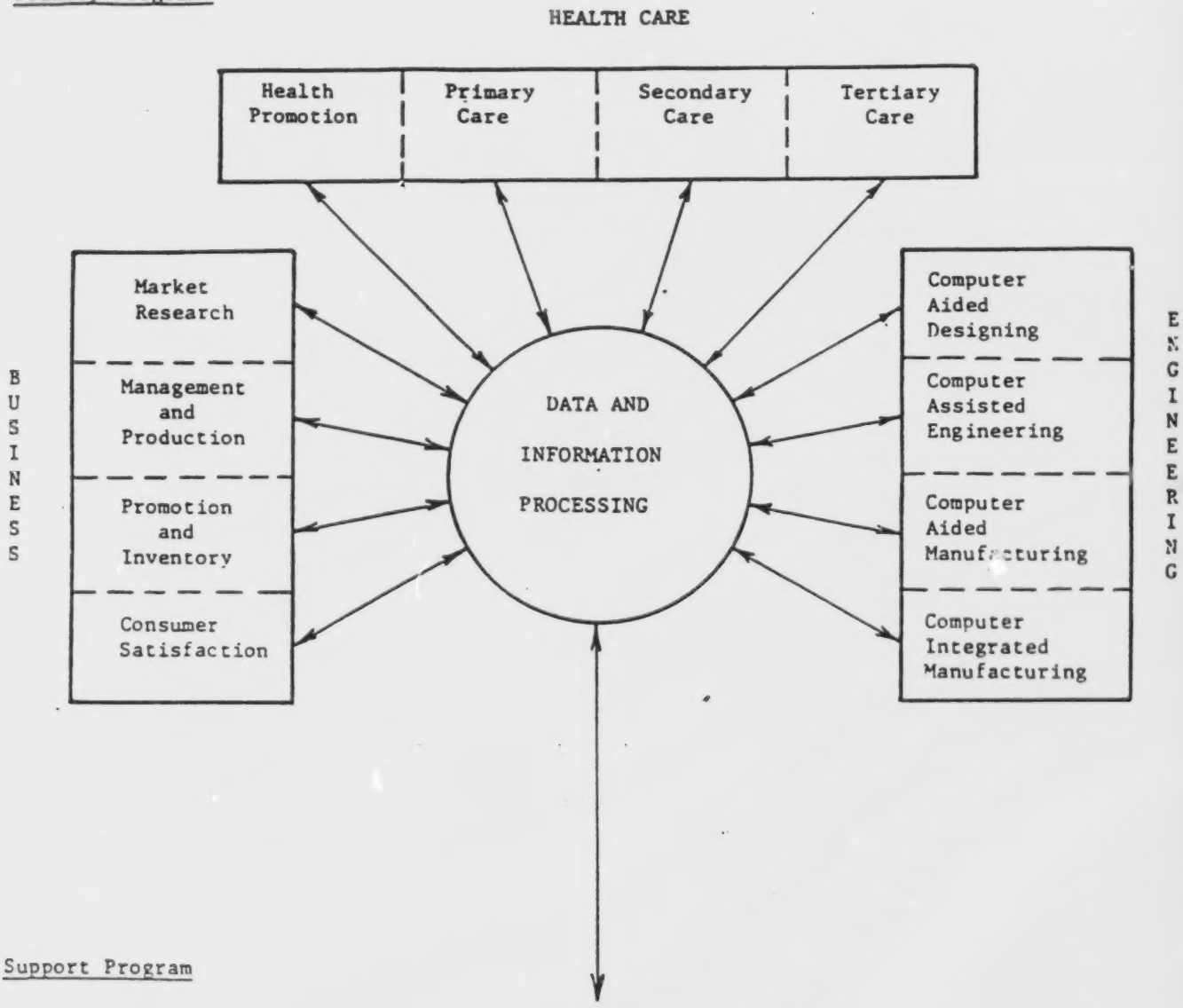
The University of Wisconsin System had one of the most sophisticated planning systems in the 1970s with categories for assumptions about future conditions and categories for goals. In 1977-78, North Central Technical College, Ohio, began a planning process which included a detailed analysis of contextual variables which were extrapolated through the 1980s for business, engineering, health, and public service programs. Then, assumptions were specified using ten categories at institutional and program levels. NCTC then specified strategic directions as follows:

1. Information Processing
    A. Computer Literacy
    B. The Office of the Future or the Paperless Office
2. Electronic Delivery of Educational Programs and Services
    A. Interactive Diagnostic and Instructional Systems
    B. Tecommunications and Teleconferencing Systems
3. High Technology
    A. Advanced Machine Tool Design
    B. Microelectronics
    C. Robotics
    D. Lightwave Circuit Technology

NCTC also created a conceptual framwork which positioned data and information processing at the core of the business of primary and support programs (see Attachment 5).

DATA AND INFORMATION PROCESSING AS THE CORE
OF THE HIGH TECHNOLOGY INFORMATION SOCIETY

Primary Programs



Support Program

Strategic Planning, Management, and Evaluation

Market Analysis					Outcomes and Impact Analysis

Advances in communication and information technologies made it possible to envision entirely new learning delivery systems in the 1980s. In 1984, the New York Institute of Technology announced it was possible to complete a four-year degree program via personal computer and modem. Technology intensive delivery systems were described in Any Home A Classroom (Halperin, 1984) and The Education Utility (Gooler, 1986). Thus, scenario classifications in the mid 1980s shifted to (a) contemporary traditional, (b) partial technological, and (c) technology intensive. Following a comprehensive contextual analysis and concensus on qualitative improvements, an institution in Texas specified three scenarios and an action plan using these categories.

An analysis of alternative education completed in the late 1980s and presented at a workshop for the Department of Education of Arkansas in 1989 yielded the following categories of alternative education: within contemporary traditional education (CTE), partial technological/ Technology intensive deschooling (PTD), collaborative lifeling learning (CLL), and solution based education (SBL), an extension of outcomes based education (see Attachment 6). One unique model of CTE is the Middle College High School, a high school on a college campus. Following a comprehensive contextual analysis and concensus on qualitative improvements, an institution in Arizona specified scenarios for CTE, PTD, CLL, and SBL.

Advances in communication and information technologies will accelerate with multilingual voice activitated devices and videoconferencing. These new technologies provide an opportunity to envision entirely new conceptual frameworks for human resources development. The core component of such a human resources development system will be communication and information technologies (Groff, 1987). Other components would include (a) a comprehensive learning center, (b) instructional resources center, (c) communications and information center, and (d) career information services (see Attachment 7a). Computer-based distance education creates new possiblities for scenarios. Extrapolation of technological advances and a broad range of other variables led to a conceptual framework with multiple "choices" as depicted in "Info Era Learning Communities of the Future" (see Attachment 7b).

One institution used several of these frameworks for visioning. The Nebraska Comunity College Association made a commitment to strategic planning in 1991. The process involved 68 statewide and community policy makers, college personnel, and students. The strategic plan specified eight areas for emphasis. Following adoption of the plan by the NCCA Board of Directors at the Annual Meeting in February 1992, the Mid Plains Community College Area implemented a process that included 103 persons: fourteen members of the

ALTERNATIVE EDUCATION

1. Contemporary Traditional Education (CTE) Models

   a. Within a CTE Classroom
   b. Within a CTE School
   c. Within a Single Subject - Math, Science, Humanities
   d. Between Subjects - Math and Science, English, and Social Sciences
   e. Between Tracks - Academic and Vocational
   f. Between Schools Within a District - Level, Magnet Schools
   g. Between Districts - "Choice"
   h. Within a State - North Carolina School of Arts
   i. Special Focus - "At-Risk", Drop Out Prevention, Disciplines, Articulated, Differentiated/Developmental Curriculum, Learning Styles, Pregnant Females, Substance Abusers, Cultural Diversity, Substance Abuse, Personal Abuse
   j. Between Layers - Middle College High School

2. Partial Technological Deschooling (PTD) Models

   a. Distant Learning Systems
   b. Apple Classrooms of Tomorrow - Elementary Level
   c. IBM's School of the Future - Secondary Level
   d. The Education Utility

3. Collaborative Lifelong Learning (CLL) Models

   a. Cooperative Education
   b. Clinical Affiliations
   C. Compacts - Academic Credit for Public Service
   d. Partnerships

4. Solution Based Learning (PBL) Models

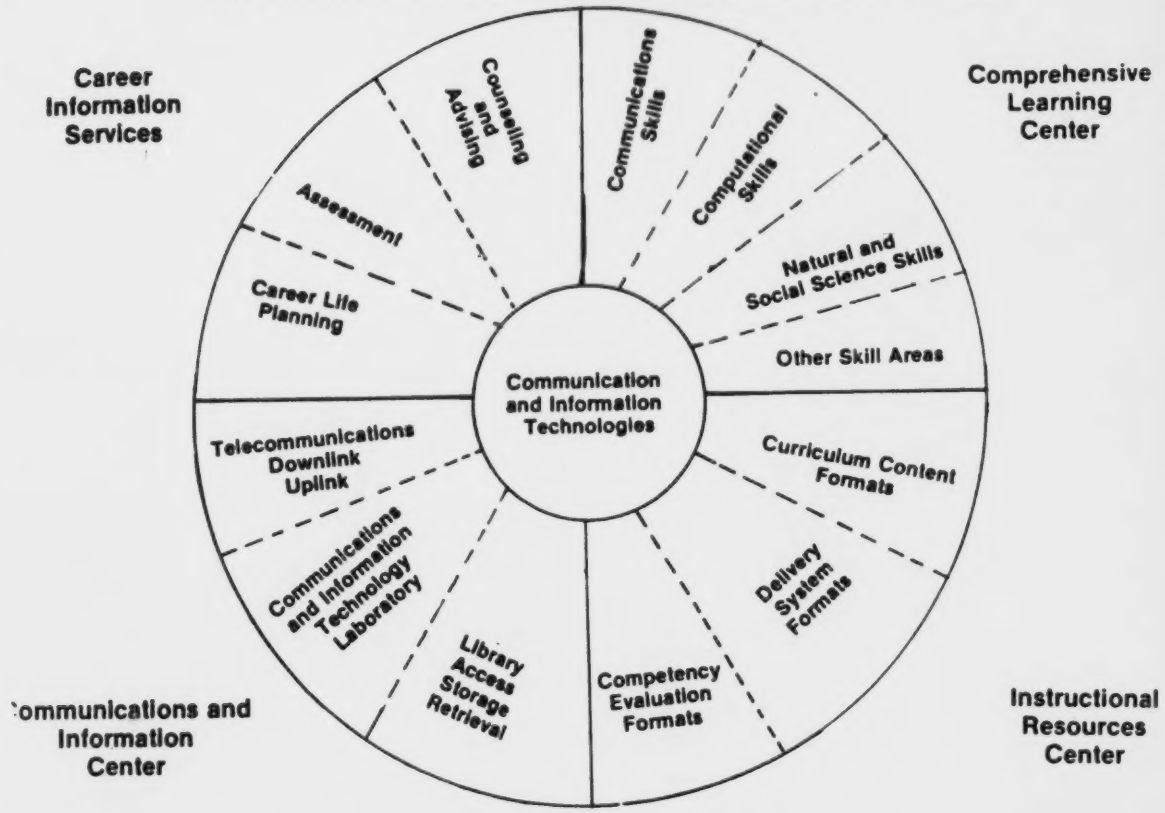
5. Other Education and Training Provider (ETP) Models

   a. Nontraditional Private Providers
   b. Corporate Sponsored Providers
   c. Home Based Instruction, Correspondence

6. Role of Support Units

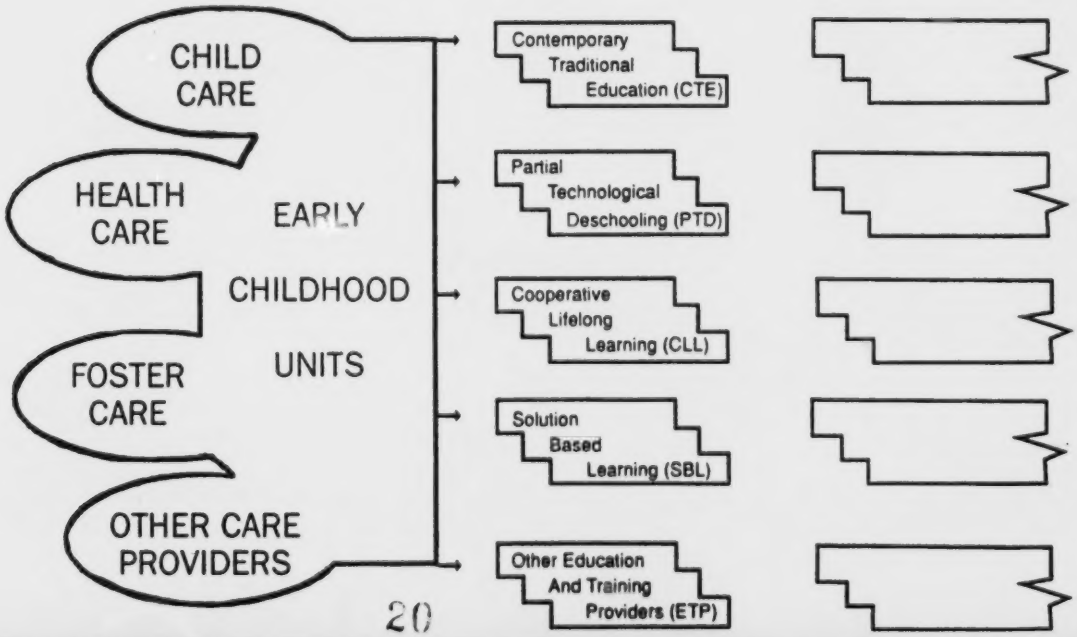
   a. Library and Instructional Materials
   b. Instructional Development and Media
   c. Student Assessment, Counseling, Diagnostic Services
   d. Administration
   e. Boards-Advisory, Committees, Directors, Foundations, Trustees

COMPONENTS OF A HUMAN RESOURCES DEVELOPMENT SYSTEM



INFO ERA LEARNING COMMUNITIES OF THE FUTURE

BEGINNING CARING & LEARNING ENVIRONMENTS	TRANSITIONAL YEARS LEARNING SERVICES ENVIRONMENTS	ADVANCED LEARNING RESEARCH & SERVICE ENVIRONMENTS



community, nineteen students, thirty faculty, eight support staff, and nineteen administrators. Superintendents of private and public schools participated. The contextual analysis was completed between spring and fall. Visioning and scenario development began on November 2. Following a visions presentation, participants joined one of eight groups, two each on Health and Human Services, Business and Industry, Government and Public Service, and Education and Training to discuss changes taking place and implications for Mid-Plains. Following a brief presentation on alternative education, eight groups began to specify scenarios: General Education Core; Remedial and Developmental Education; Vocational-Technical Education On-Site and Mobile; Remedial and Developmental Education via Distant Delivery into Community, Home, and Workplace; Next Generation Tech-Prep Programs; Rural Community Leadership & Social Infrastructure Development; Lifelong Consumer Controlled Learning for Adult Literacy; and Solution Based Outcomes Learning (see Attachment 8).

The purpose of visioning and scenario development is to create an image of a next generation system so that the preferred scenario helps to "pull" people to a higher level of commitment, to transform people and institutions. Burns (1978) drew the distinction between transactional management and transformational leadership. Transactional management occurs when individuals make contact for the purpose of the exchange of something which is often physical. Transformational learning involves mutual stimulation and elevation of attitudes, beliefs, and values. One transformational learning experience is specifying assumptions about future conditions. What assumptions should be made about emerging regions of the world and their impact on the economy, establishments, and jobs? What assumptions should be made about advances in technology and competencies and skills needed for the world of work?

A second transformational learning experience is analyzing beliefs and principles based on research about effective learning, the use of technology to enhance learning, and effective and healthly establishments. What assumptions should be made about learning to learn and human resources development systems?

Clarity in mission and vision with preferred scenario is a necessary prerequisite to clarity in action plan and effective use of resources. The extent to which people participate in the creation of mission and vision is related to the commitment to transforming them into reality.

The contextual analysis yields insight about the **REAL**. Vision and preferred scenario creation yields insight about the **IDEAL**. The **REAL** complared with the **IDEAL** yields **NEEDS** that must be expressed in an action plan.

PM GENERAL EDUCATION CORE	SP NEXT GENERATION TECH-PREP PROGRAMS
PH REM & DEV ED VIA TECH ON SITE	SH RURAL COMMUNITY LDRSHIP & SOCIAL INFRASTRUCTURE DEV
PM VOC-TECH ED ON SITE & MOBILE	SP LIFELONG CONSUMER CONTROLLED LEARNING FOR ADULT LITERACY
PH REM & DEV ED DISTANT DELIVERY COMMUNITY, HOME, WORK	SH SOLUTION BASED LEARNING FOR HEALTH CAREERS

Specification of an Action Plan

The **REAL** compared with the **IDEAL** results in **NEEDS** that must be expressed in an action plan.

Strategic directions must be transformed into a multi-year action plan with components for (a) organizational development (OD) and (b) human resources development (HRD). OD components include clarity and ownership in mission, focus on quality of primary programs with appropriate support programs, fostering a positive climate and culture, and promoting research based principles of institutional effectiveness. HRD components include conceptual, interactive, and technical competencies and skills. An establishment achieves maximum synergism when OD and HRD components are in harmony and built upon the principles of Total Quality Commitment.

What is necessary to help each learner become "ready to learn?" What are the multi-year increments of growth that should be achieved to promote understanding of cultural diversity and learning preferences? What is required to create and implement a science, technology, and society program? What is necessary to create an articulated and integrated math, science, and technology curriculum with benchmarks between the layers of education? What is required to internationalize the curriculum? How would a team of persons create an action plan for outcomes-based or solution-based education? What is necessary to create an "open entry - open exit" course, sequence of courses, or program? How would a partial technological or technology intensive delivery system unfold over a multi-year time frame? What steps will be required to incorporate the results of the occupational skills projects into the curriculum? What would be required to create a Middle College High School? How would a group create a plan for an electronic learning community?

<u>Ready To Learn</u> (Boyer, 1991) has multiple dimensions which are both people centered and system centered. In its broadest people centered sense, concepts of ready to learn apply to young children in the early years, youth in the transitional years, adults, teachers, status managers, and policy makers. Oregon School Superintendent Norma Paulus stated on September 16, 1992

> Lack of school readiness among many children "is a dirty, ugly secret in every elementary school in this country. Too many children are unloved, unwashed, and unfed, and it's been dragging down the system...drugs, violence, and the breakdown of the family. We've been trying to deal with the problem too late...(putting) all our money in with the... 17-year old when we should have been putting it into parenting and early childhood development.

At the adult consumer level, many generations of workers were graduated with inadequate technical skills for today's workplaces, not to mention tomorrow's workplaces. In addition, many are the output of a factory sorting and training process which did not prepare them for learning to learn or give them self esteem to cope with life's problems. Many adults even less fortunate have experienced only dysfunctional establishments are now caught in a cycle of poverty and social services, including incarceration at a cost to society far greater than an up front investment.

At the teacher and status manager level, almost all providers and managers were "bluebirds" of traditional education at the undergraduate and graduate levels. They were "trained" to be service providers in traditional education and may not be receptive to alternatives even with the best transformational learning experiences such as those stated in the previous section. At the policy level, ready to learn may become even more complex in that the process of obtaining board members sometimes poses ethical and moral dilemmas when creating policy. Is a board member encumbered by a constituency or is s/he ready to learn from the contextual analysis and transformational learning experience and then develop a coherent position and help others through a similar learning process? There is considerable evidence that far too many boards are engaged in bad habits of micromanaging education at a time when creative statesman-like leadership is needed for rethinking about restructuring and revitalizing the learning industry (Danzberger, 1992).

It would be impossible to create a multi-year plan for each of the topics in the above-mentioned questions. In Education Reform for the '90s: The School Board Agenda, the National School Boards Association (1990) focuses on five areas: (a) restructuring, (b) technology, (c) vocational education, (d) teachers and administrators, and (e) early childhood education.

The primary business of education is human resources development. The critical outcome is learning to learn. For consumers, the focus is on competencies and skills which are necessary to be a citizen, family member, worker, and lifelong learner in the society of which they will be a part -- the 21st Century. For providers, the focus is on (a) the mosiac of developmentally appropriate learning experiences for "each" unique individual and (b) how can s/he co-create and continuously refine the set of learning experiences through a strategy such as Total Quality Commitment (TQC).

Examples will be drawn from establishments that went through modernization and then began to restructure. After NCTC specified strategic directions in 1977-78, it began to add specificity to each of the major thrusts. For example, competencies in computer literacy were specified which

ranged from every consumer and provider being able to read a printout to high level technical skills such as application, language proficiency, and systems analysis and design (see Attachment 9). Language proficiency varied in data processing programs and various other business programs. Specific skills were quite different for language proficiency in drafting, mechanical, and electronic engineering programs. These competencies and skills were stated as outcomes. Programs to orient school district superintendent and other managers were conducted as a prelude to career information workshops for school counselors and faculty. Faculty and teachers collaborated on 2+2+2 agreements based on competency models developed by other institutions. A Comprehensive Learning Center was created to be responsive to individual needs and move in the direction of greater flexibility.

Thus, strategic directions were transformed into multi-year goals and annual objectives which varies from program to program. Many of the goals and objectives applied to the curriculum, instructional support, and administrative support areas. Faculty included the important ideas, such as computer literacy, in the curriculum as student learning outcomes. These competencies and skills became the core for organizing meaningful and purposeful human activity and fiscal resource allocation.

Each establishment needs a conceptual framework to provide coherence and meaning to the strategic planning process. The framework should have a set of categories which are used at the system and unit levels to refine strategic directions into system goal, then unit goals and objectives, and then individual objectives. The framework must be simple enough for all stakeholders to understand.

America 2000 provides a conceptual framework for a multi-year action plan for readiness and other imporant areas such as math and science. The U.S. must find betters ways of developing human resources in math, science, and technology to be competitive in the 21st Century. Goal 4 has three objectives:
1. Math and science will be strengthened throughout the system, especially in the early grades.
2. The number of teachers with a substantive background in mathematics and science will increase by 50 percent.
3. The number of U.S. undergraduate and graduate students, especially women and minorities, who complete degrees in math, science, and engineering will increase significantly.

The multi-year plan can be based on the adoption of standards set by the National Council of Teachers of Math, Project 2061 with benchmarks, and technology (Science for All Americans, 1991, and Benchmarks for Science, 1993).

ELEMENTS OF THE STRATEGIC GOAL OF COMPUTER LITERACY 1979

Systems Analysis and Design

Language Proficiency
- Data Processing
- Engineering

Application
- Computer Aided Design (CAD)
- Computer Aided Manufacturing (CAM)
- Inventory Control
- Statistical Quality Control

Conducting Longitudinal Studies of Student Progress

Computer Assisted/Managed Instruction
- Writing a Program
- Using a Program

Use of Optical Mark Sensing Equipment
- Upgrading Student Data Base
- Test Grading

Use of Word Processing Equipment as Input

Reading a Printout

OUTCOMES: SOLUTION-BASED EDUCATION

The systems approach of the 1940s yielded insights into three classifications of variables: (a) inputs, (b) process, and (c) outcomes. Education began to shift emphasis from inputs in the 1940s and 1950s to include process variables in the 1960s and 1970s. Performance based and competency based education began to emerge. Examples of PBE and CBS in the 1960s and 1970s included the Quality Education Program Study by the Bucks County Intermediate Unit and the Pennsylvania Department of Education, the competency-based elementary teacher education projects funded at nine universities by the U.S. Department of Education, and the competence study by the American Board of Pediatrics which produced Foundations for Evaluating the Competency of Pediatricians (1974). All of these projects relied heavily on research about task analysis, critical incident technique, and informed judgment. The third project was by a board which used the information in certifying physicians as competent pediatricians and for encouraging pediatric programs to adopt the standards.

Research by the National Center for Higher Education Management Systems and the National Center for Research in Vocational Education in the 1970s began to provide impetus to place more emphasis on outcomes in the 1980s. Outcomes were classified as output of the enterprise and impact on society. This type of research gave rise to Developing A CUrriculuM (DACUM). The emphasis on outcomes is reflected in the compentency based education movement and the evolution of problem based learning as well as the emphasis on student learning and institutional effectiveness assessment by regional accreditation associations.

Problem based learning was a conceptual framework developed by McMaster University School of Medicine in Ontario, Canada, about 25 years ago. About 10 universities in the U.S. have adopted problem based learning. The John A. Burns School of Medicine at the University of Hawaii was the first school to convert entirely to the new system. Others, including Harvard Medical School, offer a choice of traditional or problem based tracks or a hybrid of the two. The World Health Organization published an evaluation of the 10 schools using problem-based learning. Problem solving skills and retention of medical students increased in the alternative problem based educational format.

During the first two or three years of traditional medical training, students spend long days in lectures and late nights in memorizing overwhelming volumes of theory or fact. In traditional medical school training, students rarely discuss patients or their symptoms. Interns taught the traditional way have shown a great deal of dependence on their supervisors in finding answers to problems. In the

problem based education approach, students interact with patients and research a variety of medical science subjects in order to solve specific clinical health problems rather than attending lectures that cover only one subject such as pathology or physiology. The mass of knowledge is changing so rapidly that by the time a student graduates from medical school, much of what was memorized is out of date.

One very focused statement about the challenge to education appeared in Educating Americans for the 21st Century: A Plan of Action for Improving Mathematics, Science and Technology Education for All American Elementary and Secondary Students so That Their Achievement is the Best in the World by 1995 (1983):

> The basics of the 21st century are not only reading, writing, and arithmetic. They include communication and higher problem-solving skills, and scientific and technological literacy - the thinking tools that allow us to understand the technological world around us.
>
> The new basics are needed by all students - not only tomorrow's scientists - not only the talented and fortunate - not only the few for whom excellence is a social and economic tradition.

Numerous organizations and states have specified student learning outcomes. The Education EQ Project, begun in 1980, was a 10-year effort by the College Board to strengthen the academic quality of secondary education and to ensure equality of opportunity for postsecondary education for all students. Academic Preparation for College (1983) was one product of more than 200 business leaders and educators who endorsed six basic academic competencies - reading, writing, speaking and listening, mathematics, reasoning, and studying. Dialogues hosted by EQuality project collaborators yielded focused directions such as "Why Should Mathematics and Science Teachers Be Interested in Cognitive Research Findings?" (Mestre, 1987).

Numerous states have pursued competency based approaches, particularly in vocational and technical education. Dr. Willard R. Daggett of the New York State Education Department facilitated a "Futuring" project in the early 1980s which yielded reports for various occupational areas such as business, health, technical, and trade and industrial education. He synthesized the project for the Council of Chief State School Officers, highlighting policy issues, curriculum implications, and assessment (1991).

The New Jersey Occupational Competencies Project (1991) was the outgrowth of Report of The Panel on Secondary Vocational Education in New Jersey (1989). The standard competency lists identify the skills required by employers for entry level workers in accounting-booking, secretary,

nursing assistant, child care, electrician, licensed practical nurse, dental assistant, etc. Twenty occupations are being studied each year over a five-year period and occupational clusters are being developed from the lists.

The American Society for Training and Development (ASTD) is the world's largest nonprofit assocaition of professionals in training and human resources development. Over 55,000 practitioners, managers, administrators, educators and researchers in business, education, government and service organizations like health care have diagnosed competencies and skills required of work forces (see Attachment 10). Carnevale, Gainer, and Meltzer (1991) have written an ASTD best practices series on training for a changing workforce. ASTD members have extensive experience and research on content, delivery systems, and evaluation. Many private sector establishments have a major commitment to education such as Motorola, Inc., first winners of the Malcolm Baldrige National Quality Award (Wiggenhorn, 1990).

Several organizations have set standards in addition to the National Council of Teachers of Mathematics. Standards have been set by the National Academy of Sciences, National Center for History in Schools, The Center for the Study of Reading, National Council of Geography Education, Center for Civic Education, and Music Educators National Conference (see Attachment 11). The U.S. Department of Transportation mandates the "National Standard Curriculum" with over 1,000 objectives for the Emergency Medical Technician - Paramedic.

An integral part of America 2000 is the U.S. Department of Labor's work in helping to specify workforce competencies and assist education with strategies for implementation. The Secretary's Commission on Achieving Necessary Skills (SCANS) has issued a series of reports. What Work Requires of Schools (1991) contained the following statement:

> For most of this century, as this nation took its goods and know-how to the world, America did not have to worry about competition from abroad. At home, the technology of mass production emphasized discipline on the assembly line. Today, the demands on business and workers are different. Firms must meet world class standards and so must the workers. Employers seek adaptability and ability to learn and work in teams. Our young people leave school without the knowledge or foundation required to find and hold a good job. Unless all of us work together to turn this situation around our nation will pay a very high price -- low skills leads to low wages and low profits.

Another valuable report is Learning a Living: A Blueprint for High Performance (1992).

AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT (ASTD)

HUMAN RESOURCE DEVELOPMENT (HRD) PROFESSIONAL COMPETENCIES
(35 key areas of knowledge and skill in HRD work)

Technical Competencies

Adult Learning Understanding
Career Development Theories and Techniques Understanding
Job Competency Identification Skill
Computer Competence
Electronic Systems Skill
Facilities (logistics) Skill
Objectives Preparation Skill
Performance Observation Skill
Subject Matter Understanding
Training & Development Theories & Techniques Understanding
Research Skill

Business Competencies

Business Understanding
Cost-benefit Analysis Skill
Delegation Skill
Industry Understanding
Organization Behavior Understanding
Organization Development Theories & Techniques Understanding
Organization Understanding
Project Management Skill
Records Management Skill

Interpersonal Competencies

Coaching Skill
Feedback Skill
Group Process Skill
Negotiation Skill
Presentation Skill
Questioning Skill
Relationship Building Skill
Writing Skill

Intellectual Competencies

Data Reduction Skill
Intellectual Versatility
Observing Skill
Information Search Skill
Model Building Skill
Visioning Skill

Self-knowledge

Mathematics

To order *Curriculum and Evaluation Standards for School Mathematics*

The National Council of Teachers of Mathematics
Order Processing
1906 Association Drive
Reston, VA 22091

Item number: 398E1, ISBN 0-87353-273-2

Cost: $25 each (discounts for bulk orders)

Science

National Academy of Sciences
National Research Council
2101 Constitution Avenue, NW
Washington, DC 20418

Contact: Ken Hoffman

Completion: summer 1994

History

National Center for History in the Schools
at UCLA
231 Moore Hall, 405 Hilgard Avenue
Los Angeles, CA 90024

Contact: Charlotte Crabtree

Completion: spring 1994

Arts

Music Educators National Conference
1902 Association Drive
Reston, VA 22091

In coordination with the American Alliance for Theatre and Education, the National Art Education Association, and the National Dance Association

Contact: John Mahlmann

Completion: summer 1994

Civics

Center for Civic Education
5146 Douglas Fir Road
Calabasas, CA 91302

Contact: Charles Quigley

Completion: summer 1994

Geography

National Council of Geographic Education

In coordination with the Association of American Geographers, the National Geographic Society, and the American Geographical Society

Contact: Anthony de Souza
Geography Standards Project
1600 M Street, NW
Washington, DC 20036

Completion: winter 1993

English

The Center for the Study of Reading
174 Children's Research Center
51 Gerty Drive
Champaign, IL 61820

In coordination with the National Council of Teachers of English and the International Reading Association

Contact: Jean Osborn

Completion: fall 1995

The U.S. Department of Education has funded 22 skills standards projects. These projects will set minimum standards for various occupations over the next three years. For example, the Graphic Arts Technical Foundation in Pittsburgh, PA, has been engaged in task analysis for many years and converting the information into training programs for the industry. GATF is coordinating the National Printing Skills and Knowledge Standards Project which will set skills standards for the industry over the next few years and field testing some of the standards on-line.

A solution based learning (SBL) environment is intended to produce lifelong high performance learners and workers by placing more emphasis on critical thinking and problem solving. The emphasis shifts from the acquisition of factual information to the solution of problems and learning to learn through problem solving. SBE would be based on contemporary research from the cognitive sciences about how the brain works and on contemporary communication and information technologies. Education would begin to shift the focus away from the Carnegie Unit and other industrial era formats as the primary indicator of success to other meaures of output and impact.

How would an establishment begin to create an SBE program with a focus on the cognitive sciences and contemporary communication and information technologies? Leaders committed to improving education will implement some form of planning process which uses a strategy, perhaps OBE or SBE for improving learning for all students. The process will yield strategic directions that will be refined into goals and objectives to which resources will be linked.

One hallmark of the U.S. is diversity -- people and systems. When the U.S. emerged in the agricultural era, blacks from Africa provided much of the human resources to build the economy in southern states. When the U.S. matured as an industrial power, immigrants primarily from Eastern and Western Europe provided much of the human resources to extract things from earth and manufacture goods in factories. As the U.S. entered the post-industrial era, Hispanics provided much of the human resources to sustain agriculture and many service sector jobs. During the early technical era, immigrants from India and Pacific Rim countries provided an increasing share of the human resources in technical fields such as math, science, and engineering. Population growth in the U.S. between 1990 and 2030 is predicted to be as follows:

White	+ 25%
African American	+ 68%
Asian, Pacific Islanders & American Indians	+ 79%
Latino Americans	+187%

Appreciating cultural diversity is essential to the promotion of positive collaborative relations as well as the resolution of interpersonal conflicts and problems. Understanding beliefs, culture, and values is critical to enhance learning. An even higher level of sophistication is required to create and market goods and services which respond to the unique needs of people in other countries: Language, politics, values and attitudes, law, education, relgion, technology and material culture, and social organization (see Attachment 12).

A first task is to determine what is developmentally appropriate content for a multicultural curriculum. Several states have modified their curriculum based on changing demographics. In 1980, one-fourth of all foreign-born persons in the U.S. lived in California. Minorities make up more than 54% of the state's population under age 18. California made a commitment to change its history and social studies curriculum for multicultural education. Several states are implementing OBE and are specifing student learning outcomes and can benefit from the content formats developed by other states.

A second task is to identify developmentally appropriate delivery system formats to help diverse students acquire the student learning outcomes. The traditional education delivery system format is a teacher with approximately 30 diverse students in a classroom. Even the most creative teacher cannot begin to maximize "learning for each." Recognizing cultural diversity is to accept the fact that humans of all ages have different learning preferences and their learning outcomes, however assessed, are directly proportional to an appropriate delivery system. Contemporary communication and information technologies can broaden the range of strategies that can be made available different learning preferences which have their origin in beliefs and culture.

At this point it is important to highlight some of the characteristics of SBE. Experimentation with performance based education was necessary to broaden our understanding which led to competency based eduction and then to outcomes based education. Problem based education has a focus on the diagnosis of the problem in order to solve it. SBE has a focus on a total quality solution. What is the information literacy needed for a solution? What are the data elements? What are the sources of data? What is required to access the data? How should the data be formatted to yield intelligence? SBE begins with "mind-set" of each person and extends to "full service systems" focused on solutions. The emphasis in SBE is on going beyond the analysis or diagnosis of the problem to the solution.

IMPORTANT ELEMENTS IN UNDERSTANDING OTHER COUNTRIES

LANGUAGE

Spoken language
Written language
Official language
Linguistic pluralism
Language hierarchy
International languages
Mass media

POLITICS

Nationalism
Sovereignty
Imperialism
Power
National interests
Ideologies
Political risk

VALUES AND ATTITUDES

Toward time
- achievement
- work
- wealth
- change
- scientific method
- risk taking

LAW

Common law
Code law
Foreign law
Home country law
Anti-trust policy
International law
Regulation

EDUCATION

Formal education
Vocational training
Primary education
Secondary education
Higher education
Litarery level
Human resources Development

RELIGION

Sacred Objects
Philosophical system
Beliefs and norms
Prayer
Taboos
Holidays
Rituals

TECHNOLOGY AND MATERIAL CULTURE

Transportation
Energy systems
Tools and objects
Communications
Urbanization
Science
Invention

SOCIAL ORGANIZATION

Kinship
Social institutions
Authority structures
Interest groups
Social mobility
Sexual stratification
Status systems

EFFECTIVE ESTABLISHMENTS

Mission and Vision

In the U.S., Education is essentially a state function. States range from highly centralized to decentralized in policy making and in directing the educational enterprise. "Third Wave" pioneers of new strategies tend to be found in states which have (a) high profiles of decentralization, (b) high regard for the value of education, and (c) the critical mass of excellent resources to support innovative approaches and a willingness to support new ideas. However, creative approaches are also found in the worst of economic and social conditions, out of necessity.

Effective establishments have a clear mission statement and a concise vision statement. The mission statement explains the nature of the business and the vision statement indicates where the business is heading. The mission and vision statement should be based on a set of beliefs which reflect principles and values of stakeholders.

Strategic Thinking

Effective establishments have policies and strategies intended to achieve the mission and vision that include some process for thinking strategically about the future. Strategic planning is a process technology that can help establishments evolve through the next increment of growth. Planning must be matured to a high level of strategic thinking about (a) restructuring contemporary traditional education and (b) envisioning entirely new human resources development systems to provide for greater access to higher quality caring and learning environments at a lower cost through technology -- a greater return on investment (ROI).

Maximum synergism is achieved through leadership which empowers a broad range of consumer-provider stakeholders in creating and co-creating a vision with preferred scenarios. The preferred scenario must be converted into a multi-year action plan with organizational development and human resources development components (see Attachment 13a).

America 2000 is a framework for goals and objectives (a) readiness to learn; (b) student success through retention; (c) basic competencies in core subjects; (d) math, science, and technology; (e) adult literacy through lifelong learning; and (f) safe learning communities -- people in neighborhoods, municipalities, and global partnerships. A framework can be created for each of the six goals or for each objective (see Attachment 13b). The next sections of this document provide more detailed examples for several America 2000 goals and objectives.

STRATEGIC THINKING: MAXIMUM SYNERGISM =

LEADERSHIP THROUGH

OD + HRD + TQC

Pre Program Audit	Year 1	Year 2	Year 3	Year 4	Year 5	Post Program Audit
Organizational Development						
Mission Primary Program Secondary Program Climate/Culture Institutional Effectiveness						
Human Resources Development						
Conceptual Interactive Technical						
Hoped for Outcomes	←				→	Actual Outcomes

LEARNING COMMUNITIES GOAL CATEGORIES

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
READINESS TO LEARN					
STUDENT SUCCESS RETENTION					
BASIC CORE COMPETENCIES					
MATH SCIENCE TECHNOLOGY					
LIFELONG LEARNING COMPETENCIES					
SAFE LEARNING COMMUNITIES					

BEST COPY AVAILABLE

READINESS AND SERVICE PROVIDERS

What is the **overreaching purpose** that will shape an action plan on readiness to learn? What beliefs and values are reflected in the ideas to be included in the policy statement? Following approval by the Bucks County Schools Intermediate Unit Board of Directors (Doylestown, PA) in November 1989, a thirty member strategic planning committee was created that specified a set of fundamental beliefs (Planning). Some of the ideas in this set of beliefs provide an excellent framework for a vision and purpose statement on readiness to learn (see Attachment 14).

There are essentially four life centers: family, education, work, and community. A community (neighborhood) is a mosaic of potential care givers and service providers that can positively contribute to readiness to learn. What is the **role** that each societal component can play in readiness to learn for specific **target populations**? Because healthy bodies and minds of newborns will have begun with healthy bodies and minds of mothers and fathers, what are the **perceived and real needs** of young individuals as they enter and progress through child bearing years? Because every parent will be a child's first teacher, how will society set priorities to provide access to quality support services at a reasonable cost to achieve a greater return on investment to the individual and to society?

Down through the years, policy has been recommended by special interest groups or mandated by the judicial system and implemented by federal and state governments. This approach operates on the basis of chopping people up into their component problems and creating a bureaucratic stream for distributing resources for each component (Raspberry). These bureaucracies all too often become ineffectual and only marginally interrelated. A youth-in-crisis or her/his parents are expected to negotiate the maze of agencies, programs, and elibility rules in order to get help. Even providers don't know all of them. Veronica Coleman stated, "Infant mortality, childhood poverty, births to young unwed mothers, and juvenile crime statistics all suggest the nation cares little about its rising generation." Paul Adams, indicated, "The fact that the United States ranks 22nd in infant mortality suggests neglect." The problems may get worse due to substance abuse (Children's Monitor, 1991) and drug-resistant bacteria (Toner, 1992).

How would a Learning Community develop an overreaching purpose through a set of shared beliefs and values about healthy people to help them become "ready to learn?" How would a set of beliefs and values be transformed into an action plan for restructuring establishments and creating entirely new ones that would nurture positive development? Appendix A has "Information about Effective Establishments."

Beliefs

- We believe that each individual possesses absolute intrinsic worth.
- We believe that individuals have the fundamental right to be different.
- We believe that each person has the power and responsibility to govern his/her life.
- We believe that every component of society has an obligation to provide for the welfare of children.
- We believe that the principles of democracy embodied in the Constitution and Bill of Rights provide the best opportunity for the exercise of personal freedom.
- We believe that all people have a right to a public education.
- We believe that people create their own success and fulfillment by generating and exercising choice.
- We believe that communication is essential to mutual understanding.
- We believe that all people are responsible to and for each other.
- We believe that people have the right to unrestricted opportunity to develop their talents and abilities.
- We believe that all people can learn and the limits of individual learning are unknown.
- We believe that risk taking increases the potential for growth and excellence.
- We believe that all life has sanctity and is interdependent.

America 2000, Goal 1, states "By the year 2000, all children in America will start school ready to learn." Objectives for "ready to learn" are as follows:
(a) All disadvantaged and disabled children will have access to high quality and developmentally appropriate preschool programs that help prepare children for school.
(b) Every parent in America will be a child's first teacher and devote time each day helping his or her preschool child learn; parents will have access to training and support they need.
(c) Children will receive the nutritian and health care needed to arrive at school with healthy minds and bodies, and the number of low birthweight babies will be significantly reduced through enhanced prenatal health systems.

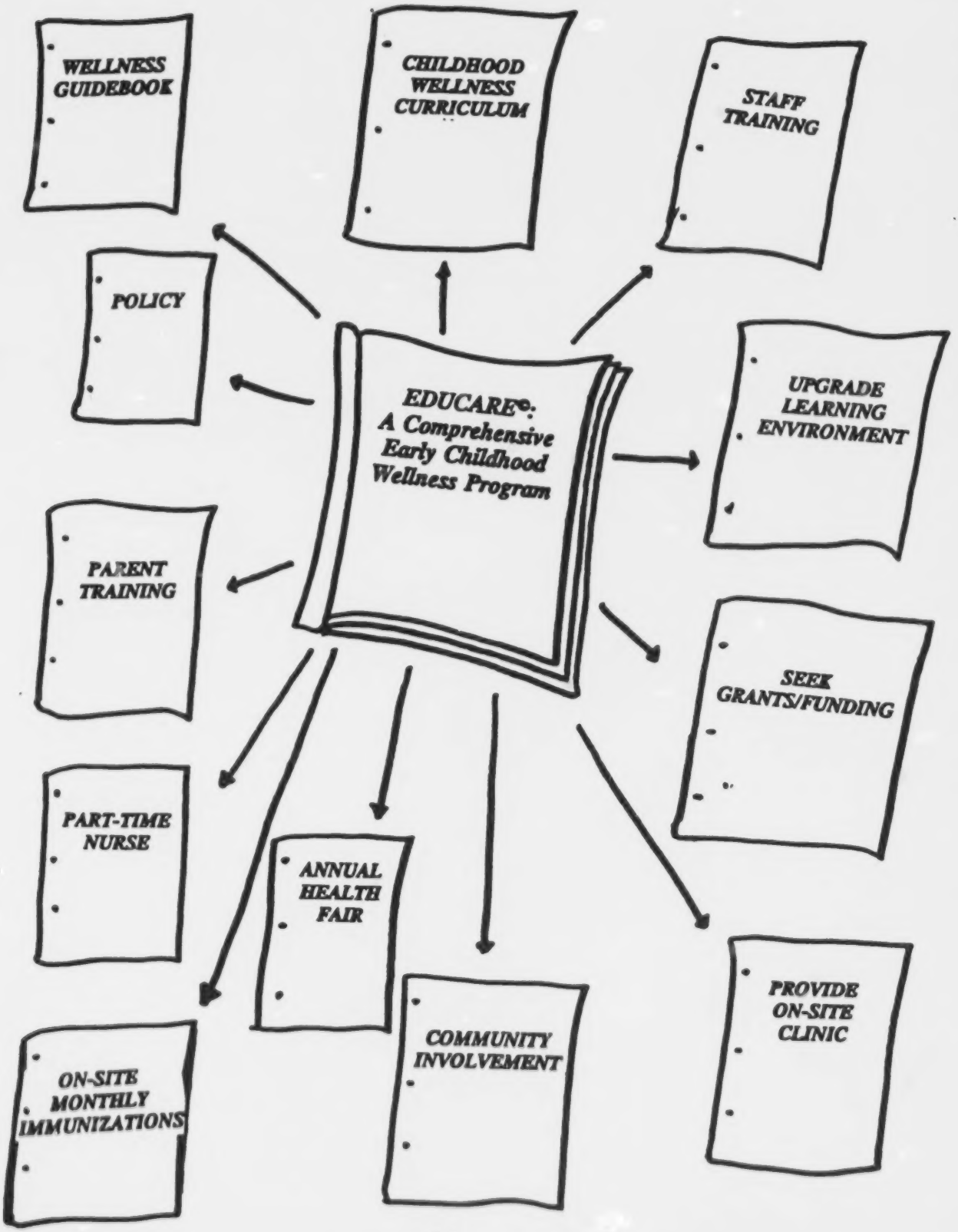
The National Education Goals Panel has indicated that "readiness to learn" includes (a) physical well-being and motor development, (b) social and emotional development, (c) approaches toward learning, and (d) general knowledge.

Indivldial Education Plans (P.L. 94-142), Individualized Family Service Plans (P.L. 99-457), and the Family Support Act (P.L. 101-485) have provided care givers, service providers, and policy makers with some experience in attempting to adjust to deterioration of one of the most fundamental units in society, the family. Recent reports suggest that the U.S. is Losing Ground (Murray, 1984) with American social policy during the 30 year period 1950-1980. Recent reports confirm the deterioration with regard to physical well-being. A report by the Employee Benefit Research Institute indicated that the number of people without health insurance reached 38.9 million in 1992, up 2.3 million from 1991; government data showed an increase greater than the two previous years combined (Number, 1993). A report by UNICEF indicated that children in many poor countries are more likely to be immunized against major diseases than those in the U.S. Recent UNICEF figures indicate that the U.S. trails many developing African and Latin American countries, including Mexico, in vaccination rates for children under the age 2.

A plan to IMPACT on the REAL problems must include a comprehensive assessment of health status of culturally diverse individuals and an audit of the current services being provided and the current infrastructure. A vision can then be created and co-created followed by a multi-year action plan with goals and objectives, methodology, and resources. Several examples are available to help as models. McDaniel (1993) completed a comprehensive analysis and envisioned "EDUCARE: A Comprehensive Early Childhood Wellness Program" (see Attachment 15) Howze (1993) completed a similar study and created "A Vision for Social Services Where Information Empowers." Schwartzkopf (1993)

23 A

COMPONENTS OF A COMPREHENSIVE EARLY CHILDHOOD WELLNESS PROGRAM



created a "Child-Centered Full-Service School." Kirkland (1993) created a vision for "First the Flower, Then the Fruit" to enhance communication (see Appendix B). Loftin (1994) is completing a comprehensive analysis for the "Development of a Full Service Community Family Center for Training Purposes at Okefenokee Technical Institute."

Some of the major activities could be as follows:
(a). Assess the health status of culturally diverse people.
(b). Assess health and social service establishments with particular emphasis on function based on federal and state regulations, human resources, and technological resources.
(c). Audit programs intended to produce human resources to attain and maintain competencies to IMPACT on problems.
(d). Create and co-create a vision and a preferred scenario and multi-year action plan with an annual operating plan.

Data, information, models, and strategies that make a positive impact are available at national, state, and local levels. At the national level, sources include the U.S. Departments of Agriculture, Education, Health and Human Services; National Insitutes for Health; National Institutes for Mental Health; Center for Disease Control; Children's Defense Fund; Child Welfare League of America; and many national organizations. A learning community will engage in higher levels of contextual analysis to achieve continuous quality improvements. As David Kearns stated "In the quest for quality there is no finish line." The purpose is to rise above merely adjusting to circumstances and reporters of event to becoming proactive change agents.

Preparation must be made to restructure all service sector establishments, particularly the units intended to improve the quality of life of infants and young children. New technologies used by the military to wage war and the private sector to compete in the new global economy, must be used to improve the quality of life. Several postsecondary institutions are building technology bridges to K-12 schools and supportive private and public agencies (Ricart). Metropolitan area "freenets" and other civic information networks can explain how state and local government services work and offer advice columns and discussion lists (see Attachment 16).

Lever (1992) created a vision for computer-based distance education. Implementation of distance education programs is becoming more widespread due to Star Schools, FIRST, and National Science Foundation Programs. However, a study by Conklin (1993) of 124 graduate schools of social work in Canada and the U.S. indicated only limited use of communication and information technologies. If service providers use computer-based systems to add value to themselves, they are more likely to use such systems to enhance learning or service delivery.

YOUNGSTOWN FREENET MAIN MENU

1 Administration
2 Post Office
3 The Public Square
4 The Communications Center
5 The Animal Hospital
6 The Business & Industrial Park
7 The Computer Center
8 The Courthouse
9 The Government Center
10 The Hospital
11 The House of Worship
12 The Human Services Building
13 The Teleport
14 The USA/Today Headline News
15 Youngstown State University
16 Academy One

h=Help, x=Exit YFN, "go help"=extended help
Your Choice ==>

CASE WESTERN RESERVE UNIVERSITY
COMMUNITY TELECOMPUTING LABORATORY

CLEVELAND FREE-NET DIRECTORY

1 The Administration Building
2 The Post Office
3 Public Square
4 The Courthouse & Government Center
5 The Arts Building
6 Science and Technology Center
7 The Medical Arts Building
8 The Schoolhouse (Academy One)
9 The Community Center & Recreation Area
10 The Business and Industrial Park
11 The Library
12 University Circle
13 The Teleport
14 The Communications Center
15 NPTN/USA TODAY HEADLINE NEWS
16 SPECIAL FEATURES

High Performance Learner and Service Provider

How would a group begin to create a vision to improve **Readiness** for young children and produce **High Performance Learners and Service Providers** (HPLSP) as child care providers, teachers and for health services occupations?

A fundamental principle of outcomes education is the focus on **IMPACT**, solution to **REAL** problems. What are the levels of competencies and skills that must be attained and maintained to be a high performance learner and worker in various occupations? What are the resources that a student needs to attain high performance benchmark levels? Numerous projects in the late 1970s and early 1980s resulted in lists of competencies and skills required for a broad range of occupations. For example, the Dallas County Community College District produced competency lists which were used as criteria for one-year certificate and two-year associate degree programs as well as for articulation purposes with area secondary schools and community agencies. Child care providers employed in community agencies could acquire competencies and skills while working and receive academic credit for them. Some of these 2+2 articulation programs were expanded to 4+2 (four years of secondary school and two years of college) and 2 or 4+2+2 (two or four years of secondary and two or four years of college). Teachers, faculty, and community agency personnel spent many hours specifying the student learning outcomes and in creating the hard copy print-based evaluation formats.

Many of the competencies at the postsecondary level can trace their origin to curriculum in the elementary and secondary grades. "Early Childhood Development: Birth To Three Years" and "Nutrition, Health, and Safety" can begin in elementary school. Developmentally appropriate learning experiences can include cultural diversity. By the time students reach middle school they would have competencies in these basic core areas as well as in process skills as critical thinking, problem solving, and goal setting. Each student could learn how to set goals, to collaborate with others, and to keep a journal of progress made on achieving goals and objectives. Students could be scheduled so that "service learning" could occur in a day care or child care center in the community or in a after school program in an elementary school near their homes. The same arrangements could be made for students in secondary schools so that there is a career ladder for the student as an aide while progressing through contemporary school. The same idea could be applied for students who may select other caring and service occupations including teaching. Thus, a day care or after school center could be the "clinical" site to apply some of knowledge and assist young children achieve higher levels of readiness. The service providers would deepen their own understanding and competence.

Leaders and boards of service sector establishments could collaborate on creating a vision for improved quality of life for young children based on an analysis (a) of conditions of children and families in the service area and (b) infrastructure in the service area. The leaders could adopt a policy which would allocate resources, based on a set of criteria, to give disadvantaged young children a better start in the early years. The policy could include comprehensive early childhood screening. Each child would be entitled to a comprehensive medical examination as well as a comprehensive readiness assessment -- social, intellectual, etc (Kagen, 1990; Katz, 1992; NAEYC, 1990).

Learning to learn begins with the detection and correction, to the extent possible, of physical conditions. Many simple physiological conditions go undetected and uncorrected and then develop into multi-faceted problems. All children could be immunized against major diseases and prevent more debilitating conditions later in life.

Learning to learn includes social and intellectual preparation to transition from one context or stage to another. Social readiness involves a transition from a child's home and familiar adults to adults and peers outside the family. Social readiness involves authority of other adults and protocols and routines in other contexts. Social readiness skills include taking turns, making compromises, and interacting with unfamiliar children. Even a good ratio of one professional for 10 preschool children does not necessarily yield the maximum learning experience. Many culturally diverse children never come in contact with someone from their native culture who is a care giver or a service provider. However, one professional with two or three community aides or volunteers and two or three middle school aides could have a significant impact on all members of the after school or day care "learning community."

Many middle school youth serve as "baby sitters" and attend to children in the early years. In that role, the youth are facilitators of activities which range from passively watching television to active game playing and reading stories. Youth in middle school grades could be prepared to extend the range of activities. In a manner similar to that described above, two or three community aides or volunteers and two or three middle school youth deployed in an elementary school classroom could significantly enhance learning for culturally diverse young children and also help culturally diverse adult aides.

Several creative models have evolved to impact on the lives of young children. Success for All was created at Johns Hopkins University and was the basis for Roots and Wings, one of nine projects funded by the New American Schools Development Corporation (1993).

The goal of Roots and Wings is to ensure every child a firm foundation in the knowledge and skills needed to succeed in today's world, and to go far beyond this to higher-order learning and integration of knowledge. Roots refers to strategies designed to ensure that every child can meet world class standards - early intervention for at-risk infants, toddlers, and preschoolers, tutoring for children struggling with reading, integrated health, mental health, social services, and family support. Wings refers to improvements in curriculum and instruction designed to let children soar. A key component of "wings" is a program called WorldLab, which will create a set of simulations in which students will be able to apply knowledge and skills in flexible, creative, and integrated ways to solve problems. Children in Roots and Wings will negotiate the future of the South American rain forest, manage an African kingdom, write a new U.S. Constitution, sail with Darwin, and plan a transportation system for their own country.

How can technology be used to assist children who are culturally diverse or physically handicapped? A "Roots" commitment would result in a "full service" Individualized Family Service Plan (IFSP) for each child and family which is appropriate to their culture and co-created in a collaborative manner. The cooperating service sector establishments would analyze the IFSP and match objectives to developmentally appropriate technology. A "Wings" commitment would result in a series of developmentally appropriate problems that are to be solved with resources necessary to solve them in an authentic learning experience that represents virtual reality. A Certificate of Initial Master (CIM) and a Certificate of Advanced Master (CAM) could be awarded, with warranty.

There are many products that could be used as examples. Franklin Electronic Learning Resources has numerous hand-held portable electronic tools for practicing vocabulary, grammar and mathematics. The Language Master described earlier in this document makes it possible to carry around and have access to a huge amount of information. The English/Korean dictionary is designed for the student studying English as a second language. Secondary school students could use the technology to teach adults in community agencies, churches, and libraries. Beyond the specific applications, the device could be used to excite persons of all ages to pursue technology.

Assume the "Roots" commitment (a) assists a school district impacts on Readiness goals and objectives and (b) yields a larger and more culturally diverse pool of novice HPLWs who have achieved CIM and now aspire to a CAM in the

health services occupations. A school district could extend the collaborative partnership with health and human services to create developmentally appropriate "full service" IFSP for culturally diverse children and families. A school district could ask health care providers in the service area to (a) identify technology currently being used in clinics and hospitals; (b) specify technology that is anticipated being used in the future; (c) explain the evolution and use of the technology to teachers and staff; and (d) list competencies and skills, from task analysis and critical incident studies, that will necessary to deliver Total Quality services to culturally diverse clientele. In many hospitals, someone is responsible for health education and training evaluating training programs.

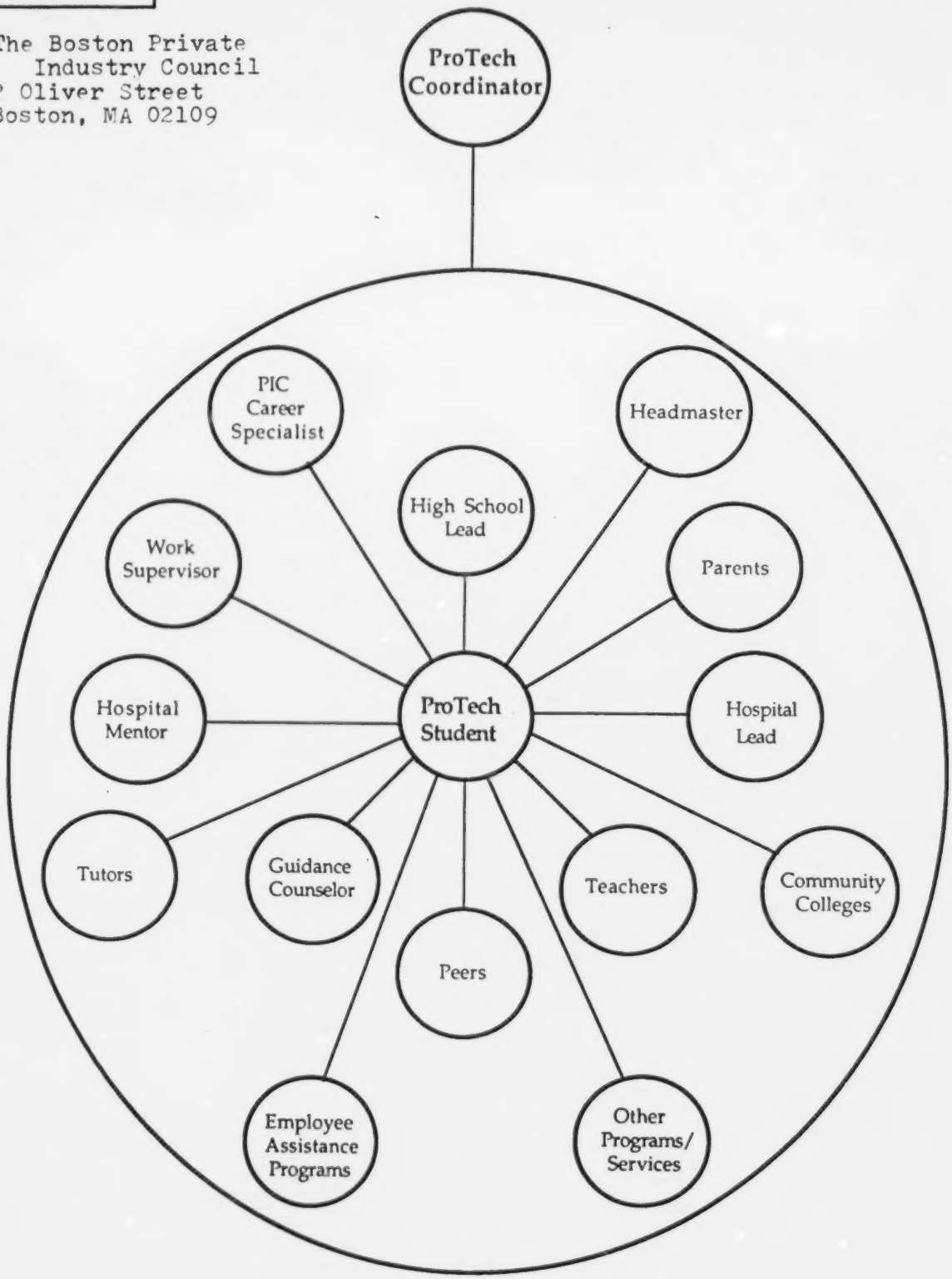
Technology being used in hospitals today is becoming increasingly more complex. The Robert Wood Johnson Foundation and The Pew Charitable Trusts distributed a request for proposals in 1988 to implement strategic planning for restructuring nursing services. A hospital in Texas created and implemted Strategic Planning to Redesign and Implement New Growth (SPRING) in 1989-90. The Strategic Planning Committee consisted of six internal and six external committees including the Technological Factors Subcommittee which analyzed technology acquired the past four years and technology which was planned for purchase. The three pages of technology was a surprise to the 100+ nurses and staff. Today, scientists can peer into the human brain through magnetic resonance imaging (MRI) and observe changes that occur as the mind works. Imagine being able to observe the chemistry of cognitive synapses while a human is engaged in the inputting, processing, and outputting of information such as the integration of math, science, and technology. Today, cataract surgery is performed on an outpatient basis. A person can walk into a clinic with sight impairment and walk out later that day with 2020 vision. Leaders and policy makers must attempt to see more clearly 2020 visions for the critical competency of learning to learn and restructure the learning enterprise.

ProTech is a model which is Rethinking to Restructure to produce HPLW in health occupations: EEG Technician, EKG Technician, Medical Lab Technician, Medical Secretary, Nuclear Medicine Technologist, Operating Room Technician, Radiologic Technologist, and Ultrasonography (Toch, 1991). The conceptual framework recognizes a ProTech student as the primary output of the learning enterprise and then identifies service providers who can contribute to a HPLW (see Attachment 17). With student learning outcomes specified, it is possible to then create content, delivery, and evaluation elements which are necessary to yield Total Quality output by the partnership and benchmark the increments for CIMs and CAMs.

PRO TECH

STUDENT SUPPORT STRATEGY

The Boston Private
Industry Council
2 Oliver Street
Boston, MA 02109



COMMUNICATION SKILLS AND KNOWLEDGE PRODUCING TECHNOLOGIES

Communications skills are critical to everyone because of the significant relationship to literacy, productivity, and democracy. Assume a state board of education adopted a set of student learning outcomes and required all districts to engage in strategic planning to map out how each district would operationalize the Goals of Quality Education. A communications student learning outcome could be as follows:

> All students use effective research skills in school products, including locating sources of information with traditional and emerging library technologies.

A science and technology outcome could be as follows:

> All students explain how scientific principles of chemical, physical, and biological phenomena have developed and relate them to real-world situations.

A school district would create a multi-year strategic plan and during the first year of the operational plan could (a) assess the advances in communication and information technology in the external environment (b) audit the communication and information technology in the internal environment. This information would be used to create the technology plan for the district: IDEAL - REAL = NEEDS.

A team of consumers and providers could analyze communication and information infrastructure with particular emphasis on public libraries.

In The Wired Society, James Martin (1978) described the progression from telegraph to telephone, to television, to telecommunications. An article in Time drew a parallel between the Interstate Highway System conceived in 1944 which covers 43,300 miles and "Networking the Nation" (1986). Concrete highways were to the industrial era what electronic highways are to the advanced technical era. Former Senator Albert Gore, Jr., introduced the National High Performance Computer Technology Act of 1989. President Bush announced a $2 billion plan to network 1000 R & D Centers in 1989. The "High-Performance Computing Act of 1991" is now Public Law 102-194. The National Science Foundation, several states, and national and professional organizations are developing plans which are compatable to these trends. This includes the Coalition for Networked Information comprised of the Association of Research Libraries, CAUSE, and EDUCOM. For example, EDUCOM is providing supportive interfaces for "Statewide Network Connections For K-12 Educators" (Clement, 1992) which includes the New York State regional arm of the Internet (NYSERNET), TENET (Texas Education Network), Virginia's PEN (Virginia's Public Education Network), California's TRIE (Technology Resources in Education), and others. In testimony before the U.S. House Subcommittee on Science,

EDUCOM President Robert C. Heterick called for a national network rather that a federal network and stated

> Only half of the U.S. four-year institutions are linked today and far fewer than that for two-year institutions. More libraries need to be connected along with high schools and state agencies.

The library/media center is essential in the global networked era. The role of the library has changed dramatically in the last decade. The library and media center have been transformed into an information and technology hub that is already indispensable to students and staff. There is evidence that library and computing services organizations have begun to converge as the technologies used to store and transmit information become similar. Furthermore, there is evidence that the characteristics inherent in information combined with the technical capability provided by new information technology have created the prospect of a new range of possibilities. Distance is irrelevant. Data bases and expert systems from foreign countries can be accessed in a variety of settings -- workplaces, community agencies, or home.

The centrality of the library and information services is seen in numerous activities and projects. After 13 years as president of the Online Computer Library Center (OCLC), Frederic Kilgour began developing the "Electronic Library" known as the Electronic Information Delivery Online System (EIDOS). The White House Conference on Library and Information Services for Productivity, for Literacy, and for Democracy was held in July 1991. The National Commission on Libraries and Information Science (NCLIS), with assistance from a 30 member Conference Advisory Committee, planned the White House Conference authorized under Public Law 100-382. The 50 states, District of Columbia and U.S. territories, as well as American Indian Tribes and federal library units conducted preconference activities to ensure widespread participation among their constituents to develop priorities. For example, Texas developed fact sheets for each of the three topics -- productivity, literacy, and democracy -- to assist in "Building Community Partnerships."

Are service sector establishments transitioning into the early technical era with contemporary communication and information technologies? Probably no comprehensive study exists which details the extent to which networks use contemporary technology to promote readiness to learn as described in a previous section of this document. The "Education of the Handicapped Act Amendments of 1986" required schools to shift from an Individual Education Plan mandated in P.L. 94-142 to an Individualized Family Service Plan in P.L. 99-457. A LAN comprised of care givers and service providers would make development and implementation of an ISFP very efficient, possibly even more effective.

Numerous coalitions exist between educational systems such as Think Tank in Phoeniz, AZ; the Puget Sound Educational Consortium in Seattle, WA; the Regional Consortium for Education and Technology in St. Louis, MO; and partnerships such as those recommended by the Holmes Group.

Power On! (1988) and Linking For Learning (1989) suggest increased use of technology within schools. Watkins Mill High School in Montgomery County, MD, was featured in "Wired for Learning" in U.S. News and World Report. The Montgomery County Public Schools Education Technology: Plan for the 21st Century is an outstanding technology plan. Planning for technology in Chadds Ford has yielded a technology assessment tool (Farrell and Gring). In January 1991, representatives of public education institutions in the Greater Charlotte area recognized the potential of collaborative planning for distance education. By May a resolution was signed by Southern Bell, Charlotte-Mecklenburg Schools, Gaston County Schools, Lincoln County Schools, Central Piedmont Community College, Gaston College, and The University of North Carolina at Charlotte that could make the area a national leader in fiber optic classroom networking. Also, Blacksburg, VA, is creating an "electronic village."

The Pennsylvania Community College Library Consortium recognized the centrality of the library/media center and adopted a Vision Statement at its June 1993 meeting. If the vision is transformed into action plans and implemented, the new units hold the potential for re-engineering learning and can serve as the catalyst for for creating 21st Century info era learning communities throughout their service areas.

New Jersey has the potential to be the leader among states with the approval of Assembly Resolution No. 63, the Telecommunications Act of 1992. New Jersey Bell is to replace its network with fiber optics by the year 2010. The New Jersey Intercampus Network (NJIN) holds the potential to deliver programs offered at colleges throughout the state. In addition, the "High Technology High School" for 300 of Camden County's brightest students in science, math, and health could become a model for other areas.

MATH, SCIENCE, AND TECHNOLOGY

Math, science, and technology are critical now and will become increasingly more essential in the advanced technical era. The national standards projects coupled with the occupational skills projects hold the potential for responding to some of America's most serious problems as well as impacting on problems elsewhere in the world.

The traditional education delivery system format is a teacher with approximately 30 diverse students in a

classroom. Many elementary teachers are poorly prepared in math and science and very few have any preparation in technology. At the middle school level, math and science are taught by teachers who specialize, a delivery system format that is continued into the high school level with even greater emphasis on the specialization -- algebra I and II, plain and solid geometry, etc., or biology I and II, physics I and II, and chemistry I and II, etc.

In small schools, a single teacher may teach all math and science and there may not be enough students for a class beyond the introductory course. There is usually a shortage of instructional technology and too often what is available may malfunction or is obsolete. Too often students see little connection between the lesson of the day and the relevance to real world problems.

Technology, when introduced, is too often an elective based primarily on industrial era manufacturing of goods to the exclusion of the knowledge producing needs of services sector establishments in the early technical era. Agriculture and manufacturing will be important; both will continue to be modernized and restructured on the journey of continuous quality improvement. Similar concepts and principles must be applied to service sector establishments.

As a first step, the student learning outcomes which are specified by the national standards projects can be analyzed for inclusion in a strategic plan that would include organizational development (OD) and human resources development (HRD) components. For example, the Curriculum and Evaluation Standards for School Mathematics by The National Council of Teachers of Mathematics and Benchmarks for Scientific Literacy could be adopted or modified to meet service area needs and goals be set to meet the benchmarks. In the education reform of the 1960s that involved new math (SMSG) and new science (BSCS and PSCS), several school districts began implementation in the middle years and then progressed to lower and upper grades. OD and HRD components are intertwined. An OD decision to implement standards only in the early years will not yield high performance results for middle and high school students. OD decisions must be refined into HRD commitments.

A second step would include the identification of student learning outcomes in technology that should be included in the curriculum. What concepts in technology should be included in the curriculum? Should the concepts be integrated into existing "subjects" or should they be presented as separate "disciplines?" What OD and HRD components must be included in the multi-year strategic plan and what detail of specificity should be included in the annual operational plan to which resources are linked?

High Performance Learners and Workers in MST

America 2000, Goal 4, Science and Mathematics, focuses on three broad national objectives: (a) to **strengthen math and science education** throughout the system; (b) to strengthen the number of **teachers with a substantive background** in mathematics and science; (c) to **increase the number of undergraduates** who complete degrees in mathematics, science, and engineering.

The **curriculum** that has evolved in industrial era schools and colleges is discipline/subject centered: English, history or social sciences, mathematics, natural sciences, foreign languages, etc. Professional associations and other groups undertake projects to assemble the content and process for each discipline or subject. States and local education agencies set policy and make decisions about the mosaic of regulations and rules that determines what constitutes the curriculum and sometimes how it will be delivered and when it will be presented.

The National Assessment of Educational Progress provides data about student proficiency scores in mathematics and science, as well as other subjects (NAEP). In only four states do 25% or more of the 8th grade students achieve minimum math proficiency: North Dakota, Iowa, Nebraska, and Minnesota. New Jersey placed 7th with 22.8% (28.6% for whites, 3.2% for blacks, and 4.5% for Hispanics). Pennsylvania placed 12th with 19.1% (21.8% for whites, 3.5% for blacks, and 2.5% for Hispanics). Only 36 states and the District of Columbia participated in the assessment. In science, four of five students take some form of biology. Less than 1/3 of the biology students, 26, take some form of chemistry and 1/2 of them, 13, take some form of physics.

During the modernization era, horizontal integration and vertical articulation began to emerge at the **secondary vocational** and **postsecondary technical** levels. Horizontal integration took on many forms including basic competencies integrated into vocational curriculum and taught by vocational teachers. At the postsecondary level, math and physics were sometimes taught by engineers to insure application of the disciplines to engineering problem solving. School teachers worked with postsecondary faculty to develop 3+2+2 articulation agreements that would guarantee student passage through three layers of the educational pipeline. Competency-based education matured into Developing A CUrriculuM (DACUM) and states began to implement program review. DACUM is an elaboration of the critical incident technique which uses expert workers and supervisors to communicate information about the attitudes, knowledge, and skills a person would need to work in a specific occupation.

Integration and articulation picked up momentum in the 1980s with the need to produce a competitive workforce with higher competency and skill levels. The Southern Regional Education Board published Goals for Education: Challenge 2000 (1988) and formed a consortium for Improving General And Vocational Education In The High School (Bottoms and Presson, 1989) to focus on mathematics, science, and communications skills. Curriculum was strengthened for manufacturing trades, health and related fields, and a few other areas by upgrading subjects and adding a technology course. Grubb, Davis, Lum, Plihal, and Morgaine at the National Center for Research in Vocational Education (NCRVE) listed several patterns in The Cunning Hand, The Cultured Mind: Models For Integrating Vocational And Academic Education (1990):

1. Incorporating academic competencies into vocational courses.
2. Combining academic and vocational teachers to incorporate academic competencies into vocational courses.
3. Making the academic curriculum more vocationally relevant.
4. Modifying both academic and vocational education through curricula "alignment."
5. The Academy model: schools within schools that focus on a field -- health, electronics, business.
6. Replacing conventional departments with occupational clusters.
7. Single occupational high schools - magnet optional schools.
8. Maintain conventional academic and vocational departments, but organize to have career paths or occupational majors.

The Carl D. Perkins Vocational and Applied Technology Education Act as amended by P.L. 101-392 has provided new impetus for horizontal integration and vertical articulation with a focus on alternative education. The Perkins Act provides support for tech-prep, particularly replication for established programs. Tech-prep has been emerging in business and manufacturing areas and is growing in the health occupations. Project ProTech by the Boston Private Industry Council is developing partnerships with health care providers. The Perkins Act also mandates a National Assessment of Vocational Education report for Congress.

Accountability initiatives such as program review and guarantees are being implemented. Program review is an examination of information such as centrality to mission, quality, market viability or demand, and cost. A major applied research project on program review in 1991 indicated that thirteen of twenty-one states has some form of program review for two-year colleges (Satterlee, 1991). Guarantees and warranty programs are being implemented by secondary and postsecondary institutions for various tracks.

A team of consumers and providers could analyze math and science in the context of application to solving problems ranging from the way in which knowledge is used in (a) research and development centers and (b) all other types of establishments with particular emphasis on manufacturing and services. The team could analyze problem solving in manufacturing and service establishments to determine relevance of the disciplines to solutions in the service area. Learners of all ages must see the connection between what is taught and the real world. The team could analyze what works in math and science elsewhere for culturally diverse learners of all ages. The team would conduct a program review audit: (a) content format, (b) delivery system format, and (c) student learning outcomes. The team would co-create a vision and preferred scenario with a multi-year action plan. The action plan would include the use of technology to enhance learning "for each."

A second team would concentrate on the human resources development objective of Goal 4 in America 2000. HRD includes effective approaches to human resources planning, nurturing, and utlization to achieve essential strategic directions of the mission and vision. This team would specify needed personnel qualifications, audit personnel backgrounds, audit inservice programs, analyze exemplary induction and continuous quality improvement programs, specify an HRD program, and monitor implementation and evaluation of the HRD program on student learning outcomes.

A third team could focus on the third objective of Goal 4 of America 2000 which could be refined as follows:
To specify and implement strategies which will enhance the likelihood of increasing the number of students, especially women and minorities, in mathematics, science, and technology (MST) programs. This third objective could have several components:
(a). To **attract** more students into considering education and majoring in MST programs.
(b). To **articulate** curricula between all levels of contemporary traditional education.
(c). To **analyze** curricula to identify obstacles which impede students from progressing successfully to completion.
(d). To **matriculate** more high school graduates into college programs with the intent of entering teaching.
(e). To **transition** undergraduates from core courses into teacher education and graduates into teaching.
(f). To **retain** more entry teachers and provide for their continued professional development.
The strategy described in "Readiness and Service Providers" could yield a new wave of high performance learners and workers who could enter math, science and technical careers (see Attachments 18a and 18b).

In the early 1980s, establishments began to form tighter relations to accomplish common goals. Interagency Linkages (1984) became a research interest of the National Center for Research in Vocational Education (NCRVE) when it was located at The Ohio State University through funding by the Office of Vocational and Adult Education of the U.S. Department of Education. The study was based on the work of Andrew Van de Ven (1976) and involved North Central Technical College in Mansfield, Ohio, and its collaborative relationships with Mansfield General Hospital, Pioneer Joint Vocational School, and the Mid-Ohio Consortium for Industrial Training. The interorganizational framework examines relationships: situational dimensions, structural dimensions, process dimensions, and outcomes dimensions. Certain situational conditions are necessary for interagency linkages which are resource interdependence, commitment, awareness and consensus. Interagency linkages are likely to increase as tech prep evolves into the Work INcentive Model (WIN) conceptualized by James Hoerner (1991).

A competitive workforce with higher competencies and skill levels is the critical variable in positioning the U.S. in the new world order. The municipalities, states and regions that restructure the education and work learning partnership to produce "high performance workers and learners" will be the beneficiaries of the advanced technological era.

Partnerships between business and education are being promoted by the U.S. Chamber of Commerce. One comprehensive project is The Lehigh Valley Business-Education Partnership (1991) which includes numerous task forces.

National organizations are providing guidance through reports such as Success for All in a New Century (1989) and Education Reform for the '90s (1990).

Georgia Governor Zell Miller, speaking at an America 2000 Leadership Conference on January 13, 1992, stated the challenge as follows:

> We'll either move ahead to a high wage, high skill, high growth economy or we will be left behind...to compete with the Third World countries that call for little but strong backs and low wages.

How could a Learning Community develop an action plan to assist people of all ages and cultural backgrounds work together to improve curriculum efficiency and synchronize education and workplace requirements more effectively to achieve a high growth economy?

MULTI-YEAR PLAN
GOAL 4 - MATH - SCIENCE

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Attract					
Articulate					
Analyze					
Matriculate					
Transition					
Retain					

MULTI-YEAR PLAN

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5

Printing and Publishing

The graphic arts and printing industry is undergoing fundamental change. Few areas of study could be more exciting than an analysis of the invention of printing by the Chinese and its profound effect upon culture and education throughout the world. Exciting as the history of graphic arts and printing could be, however, the more challenging and vastly more critical area of study is understanding current trends in order to anticipate the future. Several terms are defined to add clarity to the discussion which follows:

Prepress - all functions in the creation and design of a product that will be printed.

Press - all functions that relate to the printing of products.

Postpress - all functions that deal with the distribution of products that have been printed.

Curriculum - all the learning experiences of students in academic credit earning and related activities; the curriculum consists of (a) content and its format, (b) delivery system format and (c) student learning outcomes evaluation format.

Education - basic core and general information to be able to function as a citizen in a particular society.

Training - the process of acquiring skills for specific prepress, press, and postpress functions that may involve chemicals, equipment, inks, materials of all types, paper, and supplies.

Numerous organizations monitor advances in research and development and (a) communicate knowledge to help transfer the technology and (b) transform the knowledge for training. The Research and Engineering (RE) Council of the Graphic Arts Industry, Inc., is a member-driven, non-profit, technical trade association with an international clientele. RE publications include (a) a newsletter published several times a year, (b) a quarterly edition of Recent Patents of Interest to the Graphic Arts Industry, and (c) publications by various technical committees. Critical Trends for the 1990's (1989) contained 22 concise statements:

(a). Redefining the Illiteracy Problem.
(b). Education Call - R & E Responds.
(c). Public and Community Education.
(d). Management Education: The Trust Culture.
(e). Industry Training and Education.
(f). Advertising - A Look Ahead.
(g). Electronic Publishing - Preparation and Transmission of Copy.
(h). Prepress Industry Outlook.

The document ends with (i). Mergers, Acquisitions, and Strategic Alliances in Graphic Arts.

Critical Trends: Graphic Communications Industry (1994) has an indepth analysis of topics beginning with "Change: The Lifeblood of the Printing Industry" which discusses technical advances, customer services, and work forces. Of great significance to education are the topics:
(a). Productivity in the Year 2000: Work Force Training.
(b). Management Training in a Total Qaulity Environment.
(c). Promoting Caeers in Printing: A Challenge for Industry and Education.
(d). ISO 9000 and the Graphic Arts Industry.
(e). Opportunity Knocking! A Metric Wakeup Call.

The Graphic Arts Technical Foundation (GAFT) is a member-supported, nonprofit, scientific, technical, and education organization serving the international graphic communication industries (GAFT, 1992). GAFT boards and committees are comprised of some 300 representatives from companies throughout the world and represent every facet of graphic communications. GAFT has engaged in task analysis studies and created training programs for certification which are continuously updated to reflect current technology, production practices, and education and training methods. GAFT textbooks, audiovisual, videotapes, and learning modules can be found in many school and colleges in Canada and the U.S. as well as in on-the-job settings and apprentice training programs throughout the world.

The certification program is designed for students in schools, colleges, and industry operators seeking to upgrade their skills in particular areas. Certification is available in three areas:

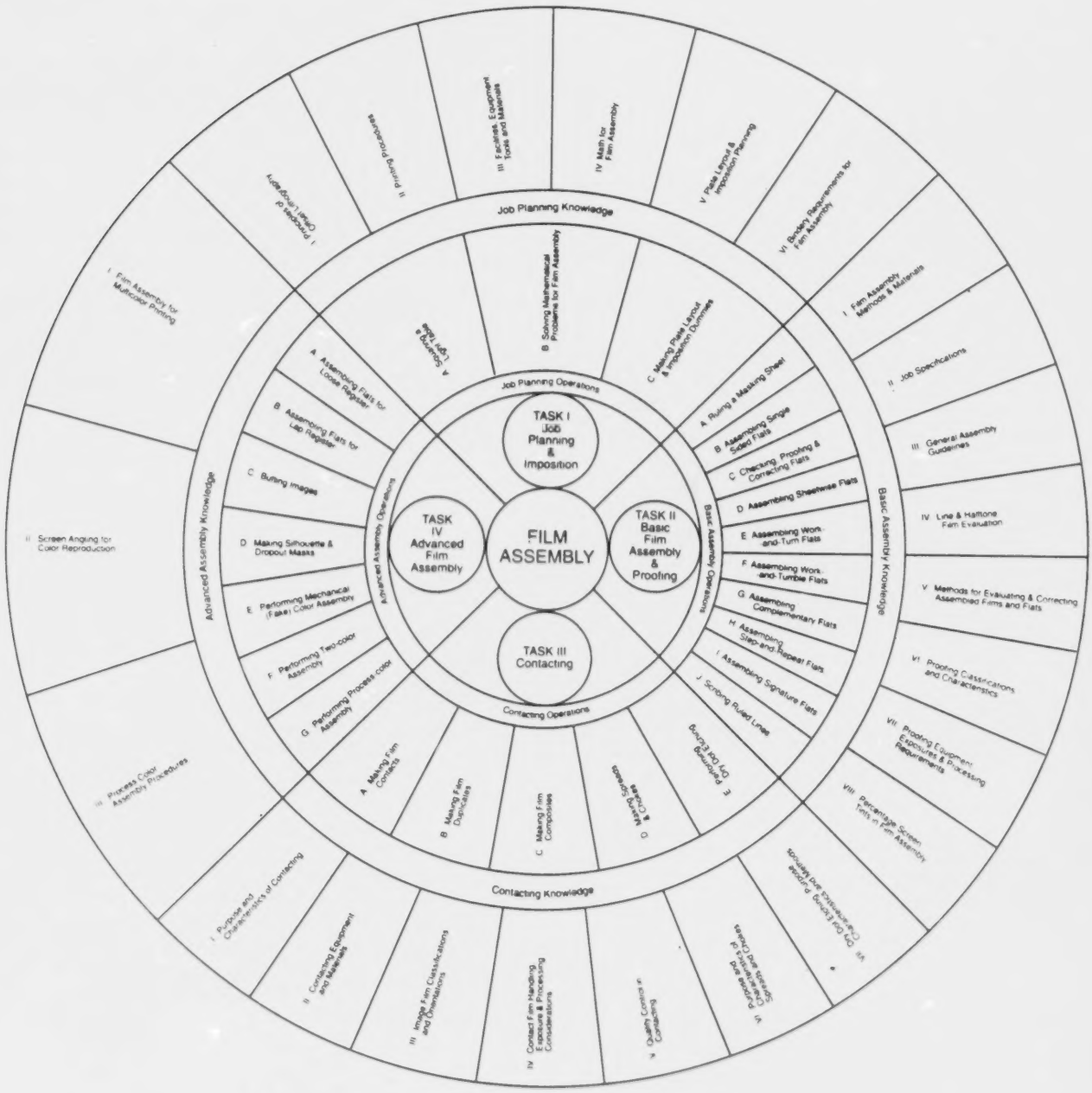
Film Assembly
Sheetfed Offset Press Operating
Web Offset Press Operating

The content of the training program is organized into production tasks, which include knowledge and operating areas. A graphic description of the Sheetfed Offset Press Operating program is Attachment 19. The outer circle of the diagram contains the 'knowledge' areas of study and in the inner circle the 'operating tasks' that a student or trainee must perform following completion of each knoweldge assignment (also see Appendix C).

GATF is coordinating the National Printing Skills and Knowledge Standards Project which will set skills standards for the industry over the next few years and field test some of the standards on-line. Graphic arts standards could be included in a "Science, Technology, and Society" developmentally appropriate curriculum from early childhood through postsecondary education levels. Such an outcomes - solution based - system is possible between schools and two-year and four-year colleges.

Film Assembly

The wheel is a graphic representation of Knowledge areas (outer circle), and Operations (inner circle).


FILM ASSEMBLY
TASK I Job Planning & Imposition
TASK II Basic Film Assembly & Proofing
TASK III Contacting
TASK IV Advanced Film Assembly
Job Planning Knowledge
Basic Assembly Knowledge
Contacting Knowledge
Advanced Assembly Knowledge
Job Planning Operations
Basic Assembly Operations
Contacting Operations
Advanced Assembly Operations
I Film Assembly Methods & Materials
II Job Specifications
III General Assembly Guidelines
IV Line & Halftone Film Evaluation
V Methods for Evaluating & Correcting Assembled Films and Flats
VI Proofing Classifications and Characteristics
VII Proofing Equipment, Exposures & Processing Requirements
VIII Percentage Screen Tints in Film Assembly
IX Dot Gain & Proofing Exposure Compensation Techniques and Variances
X Purpose and Characteristics of Contacting Operations and Classes
XI Quality Control in Contacting
XII Contact Film Handling, Exposure & Processing Considerations
XIII Image Film Classifications and Orientations
XIV Contacting Equipment and Materials
XV Purpose and Characteristics of Contacting
XVI Process Color Assembly Procedures
XVII Screen Angling for Color Reproduction
XVIII Film Assembly for Multicolor Printing
I Purpose of Digital Imposition
II Planning Procedures
III Facilities, Equipment Tools and Materials
IV Math for Film Assembly
V Plate Layout & Imposition Planning
VI Bindery Requirements for Film Assembly
A Ruling a Masking Sheet
B Assembling Single Sided Flats
C Checking, Proofing & Correcting Flats
D Assembling Sheetwise Flats
E Assembling Work-and-Turn Flats
F Assembling Work-and-Tumble Flats
G Assembling Complementary Flats
H Assembling Step-and-Repeat Flats
I Assembling Signature Flats
J Scribing Ruled Lines
A Making Film Contacts
B Making Film Duplicates
C Making Film Composites
D Using Opaques & Overlays
E Contacting Dot Etching
A Assembling Flats for Loose Register
B Assembling Flats for Lap Register
C Butting Images
D Making Silhouette & Dropout Masks
E Performing Mechanical (Fake) Color Assembly
F Performing Two-color Assembly
G Performing Process color Assembly
A Solving Mathematical Problems for Film Assembly
B Solving Mathematical Problems for Film Assembly
C Making Plate Layout & Imposition Dummies

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Printing Industries of America (PIA) commissioned SRI International to conduct a comprehensive study of the printing Industry in Canada and the U.S. (Printing 2000, 1990). The study identified four major clusters of factors: (a) macroenvironmental factors such as consumer lifestyles and general technology trends, (b) more specific factors such as labor such as labor market forces, (c) changes in printing and related technologies, and (d) changes in major printing markets.

A team of consumers and providers could analyze the printing and publishing industry. The Printing and Publishing Team (PPT) could assess prepress, press, and postpress functions throughout the "service area" as well as "contiguous" regions. "Service area" and "contiguous regions" required a very broad defintion since the discovery of cellular and fiber optic principles and the invention of data compression, digital, miniaturization of electronics, voice processing, and other technologies.

The team could analyze (a) advances in research and development that influence prepress, press, and postpress functions; (b) projections about communication and information technologies into the 21st Century; (c) printing and publishing in various establishments in the service area; (d) competencies and skills which are needed now and anticipated in the future; and (e) the existing education and training infrastructure for preservice entry into the workforce and adult literacy workforce training.

An analysis of printing and publishing in various establishments throughout the service area is essential. RR Donnelley & Sons Company is the largest Fortune 500 company in printing and publishing. Such corporations are a real asset in terms of information about worldwide trends in graphic arts and printing and many goods and services. In addition to corporations that specialize in printing and publishing, many businesses have "in house" departments of graphic arts and printing. Furthermore, desktop publishing is giving rise to cottage industries through telecommuting. Also, America is experiencing new focused growth rgions such as the Princeton Corridor and the Medical Mile in Plymouth Meeting, PA (Weber, 1992). The Princeton Corridor has 400 companies with a focus on biotech and telecommunications. The Medical Mile has 500 companies with a focus on biotech and medical products. Hence, some of the graphic arts and printing will be specialized. What are the competencies and skills that are unique to specialized establishments?

The analysis could yield information that could be useful in other ways to promote economic development and job creation. A printing and publishing establishment may be a subcontractor for a company that may be producing a product

that can be marketed internationally with assistance from culturally diverse people now living in the service area.

The PPT could then identify the content, knowlege and operating tasks, that should be considered for a CIM and a CAM. Basic knowledge for a CIM would include information about chemicals, equipment, inks, materials of all types, paper, and supplies. Operating tasks for a CIM could include basic information about film assembly and the sheet fed press and a brief introductory mention about computers and technology in the printing and publishing industry.

Some of the private sector PPT members could continue to work with curriculum specialists and teachers and create developmentally appropriate materials and strategies for learners representing all ages and cultures. Early childhood teachers may have to deal with language and fundamentals such as "crayon" and "paper." CIM students could create a variety of products, a newsletter or sign, in their native language and translate them into English. Imagine a student of Hispanic background in the early grades creating a newsletter on nutrition in Spanish, with the reverse side in English, and distributing it in a community and sending it to friends and relatives to Central or South America. A teacher could be assisted by several culturally diverse "service learning" students in the middle grades who do a "practicum" for a CIM. The teacher aides may co-create the newsletter with a culturally diverse community aide or volunteer using technology such as The Language Master.

CAM students could create a variety of products in English and another language that fits the needs of the service area through practicums. CAM students in Camden County's High Tech High School could possibly create graphic arts products on-line for the biotech companies in the Medical Mile or the Princeton Corridor.

PPT private sector members could recommend the fit of the Critical Trends information in the curriculum and advances in technology and the implications. For example, where are computing, desktop publishing, voice activated technology, and desktop videoconferencing introduced in the curriculum? Where in the curriculum are (a) advances in science and technology discussed, (b) scientific principles of technology reviewed, (c) projections into the future analyzed, and (d) ethical and moral issues debated?

Genuine partnerships can emerge between schools and colleges. A partnership of schools and colleges could create a **seamless articulated-integrated program** with **generic and domain-specific competenices.** Generic skill areas could include the basics as well as critical thinking, communications, higher-order reasoning, problem solving, cultural diversity, and teamwork. Domain-specific skills

could include the skills standards for various occupations such as printing and publishing and ISO 9000 standards.

During the early industrial era, vocational education was created as a separate track in comprehensive high schools as a general shop and then in specializations: (a) drafting and design, (b) graphic arts and printing, (c) mechanical, and (d) electrical and electronic, etc. School districts created vocational-technical schools, some of which are being transformed into postsecondary technical institutes. Students work on a sequence of increasingly more complex projects. In the 1970s and 1980s, schools and colleges created mobile vans with technology, machine shops and computer labs, to deliver the training to the consumer in schools and workplaces (Aten, 1983).

The need for exposure to contemporary technology has never been greater and will increase as nations move toward the advanced technical era. Site based labs of contemporary technology are beyond the resources of many schools and colleges. A more cost efficient approach would be a van with contemporary cellular, data compression, digital, fiber optics, and voice processing technology. A van could be "dedicated" with a concentration on one type of industry such as printing and publishing. A van could contain desktop publishing and voice activated videoconferencing technology. A mobile approach could provide access to students during the day, inservice for staff during the afternoon, and meet community and workplace needs at night.

Other projects would be possible. CoNECT is a project funded by the New American Schools Development Corporation. The conceptual framework is built on investigation themes intended to produce high performance problem solvers for some of the world's critical issues like managing water resources. The notion of linking math, science, language, geography, and history to a series of simulations holds great potential. Throughout the U.S. there are groups of students in vocational-technical programs who design and construct dorms and houses. Simulation projects could lead to virtual reality projects. Virtual reality projects could be to design smart home, "freenet" communities, and other knowledge era value added infrastructure.

While culturally diverse CIM students in printing and publishing could produce flyers and newsletters for neighborhoods, CAM students could produce more sophisticated information, like advertising and technical manuals for international trade. Corporations specializing in worldwide manufacturing and marketing of communications and information technology and business and home furnishings could create a genuine partnership with schools and colleges to "furnish" a few smart dorms, homes, and public libraries for blacks, Hispanics, and other groups.

LEARNING COMMUNITIES OF THE FUTURE

America 2000 is a spirit of renewal, an independence from the industrial era during which the United States was preeminant because it had easy access to an abundance of natural resources to manufacture goods through batch processing techniques, using the best raw material and discarding the rest. While America passed through stages of maturation, there were vast frontiers to be explored on land and sea and then in space. America and the other advanced nations are scouting new frontiers that focus on the cognitive sciences - mind - and contemporary communication and information technologies - systems. America 2000 goes beyond the format of the goals and objectives to challenge policy makers and intellectual capital to invent the next generation human resources development systems. This section will discuss (a) Learning Communities in American and (b) Global Learning Communities.

Learning Communities in America

This section will link together a number of ideas to create a conceptual framework for a learning community for inclusion of each in improved quality of life. Ideas to focus on health occupations and contemporary technology were emerging throughout the 1980s.

The Newhope Center provides diagnostic, education and training, and case management services for individuals with mental retardation and developmental disabilities in an eight county area around Mansfield, OH. North Central Technical College has an array of health occupations programs, some of which prepare individuals to provide services to these individuals. During the early and mid 1980s, a six year Center of Emphasis project was iniated to train care givers to enter diagnostic data on a PC in a home or clinic that could be transmitted to a hospital or physician's office through a Local Area Network (LAN).

During the mid to late 1980s, a Center for Excellence in Rehabilitation Education at Shelby State Community College created interactive video simulations to prepare persons in orthodics/prosthetics and physical therapy. Professionals from numerous service establishments collaborated in creating the simulations that could be used (a) to raise the level of awareness of clients about diagnostic and rehabilitation techniques and (b) to help prepare students to function as a collaborating team member in rehabilitation for each unique individual. The developers included professionals from St. Jude, Le Bonheur, and the University of Tennessee Health Science Center.

During the mid 1980s, two technology intensive delivery systems became available. The New York Institute of

Technology announced in 1984 that a four-year degree program could be completed through personal computer and modem. In 1986 it was possible to complete a masters degree via PC and modem from a California state institution.

In 1986-87, the Ford Foundation allocated resources for replication of the **Middle College High School** (MCHS) at LaGuardia Community College, an alternative high school on a college campus for at-risk students. The MCHS has ample research to demonstrate the idea works (a) for culturally diverse American students and (b) for English as a second language recent immigrants in a second MCHS. The Tennessee Department of Education and the Tennessee Board of Regents assisted the Memphis City School and Shelby State Community College to create a MCHS on the Mid-Towm Campus. During the planning year 1986-87, one of the six representatives on the planning team promoted the idea of (a) a focus on health occupations and (b) extensive use of communication and information technology. The reasons included (a) workforce and workplace needs; (b) program infrastructure and resources; (c) collaboration with The University of Tennessee Health Science Center and its commitment to communication and information technology, basic research through chairs and centers of excellence, and teaching excellence. The research about the MCHS in Memphis clearly indicates it (a) positively impacts on at-risk students and (b) demonstrats implementation EQ college standards.

These and other projects gave birth to the idea of a technology intensive secondary-postsecondary proposal to prepare service providers in health occupations. Part of the didactic instruction could be given in a traditional manner or a distance education format anywhere in the world. The clinical component would be offered in Memphis or in any area with a concentration of health care establishments with certificate and degree programs. A Memphis Tech-Prep Consortium could develop programs which could be delivered to some of the poorest counties in the lower Mississippi Delta and to countries with extreme harsh suffering in Africa, a roots and wings for health.

The concepts which are being presented focus on the use of contemporary communication and information technologies for (a) health promotion and (b) career laddering at an early age. The Institute for Alternative Futures and The Consumer Interest Research Institute have developed a proposal for 21st Century Learning and Health Care in the Home (Olson, 1992). The proposal calls for the use of networks and multimedia devices to focus on **learning** and **health** (see Attachments 20a, 20b, and 20c). The Community Learning and Information Network (1993) is a conceptual framework for the implementation of a national learning technology and information delivery system to improve and reform America's education system (see Attachment 20d).

Global Learning Communities

Global learning communities have been evolving rapidly for the past several decades as can be seen in the increase in partnerships between multi-national private sector group alliances and in the distance education movement.

Global commerce is providing the impetus for the use of contemporary communication and information technologies in the delivery of education and training. Asea Brown Boveri (ABB) is the world's largest electrical engineering group and is renowned for its research, product development, low cost manufacturing, and the transfer of technology and know-how. ABB is a highly decentralized organization with business units distributed in 140 countries, employing over 200,000 people, with a net sales in excess of $30 billion U.S. (Telegate, 1993). ABB Corporate Network, ABB-CN, is used to communicate accurately and quickly through the concept of open communications which uses many types of transmittal media: data, text/fax, voice or image video. ABB-CN has been developed to provide various types of communications capabilities around the world for the exchange of drawings, proposals, and technical information.

In Finland, ABB operates via a nationwide conglomerate of independent companies, ABB Group Oy, divided into more than 40 operating locations dispersed around the country with the head offices in Helsinki. ABB Group Oy makes use of the latest communications technologies, including Telecom Finland's full service concept known as Telegate. On May 3, 1993, Telecom Finland announced the world's first commercial ATM (Asynchronous Transfer Mode) which initially connects Helsinki with Tampere, 200 km to the north (Heinanen, 1993). ATM is a fast packet switching technique to transmit data in short, fixed size cells of knowledge efficiently at very high rates. Thus, Finland was the first country in the world to implement an ATM distributed multimedia communication network for the transmission of data, voice, and video simultaneously at speeds 1,000 times greater than had been possible prior to that date. The pilot will last one year, during which it will evolve into full production of this strategically important new backbone technology.

Telecom Finland is also in numerous projects using mobile technology (Mobile, 1993). In cooperation with the National Research Centre for Welfare and Health, four communities volunteered to apply mobile communications to areas of health and welfare beginning in 1987. Ulvila, in western Finland, wanted to focus on the day care of children to improve the cooperation between parents, kindergarten, and community personnel. The results have been impressive. Beyond the clear savings in expenditure, the results have yielded (a) changes from a hierarchial structure of work to horizontal interactive networking; (b) changes in self

confidence, communication skills, motivation to improve skills, and new possibilities to work better; and (c) creative meetings between producers and providers of health and social services. The producers had not envisioned all the possible applications of the new mobile communication technology and the social workers had not imagined all the possible application of the technology -- solutions to problems. Consumers and providers who use contemporary communication and information technologies are more likely to continue to use such systems in whatever role they perform -- care giver, educator, or health services provider.

The European Association of Distance Teaching Universities (EADTU) was established in 1987 by the principals of major distance teaching institutions to foster cooperation between organizations dedicated to higher education through distance teaching methodology (see Attachment 21). Activities and projects include (a) communications and information exchange, (b) collaboration in course and credit transfer and joint production, and (c) development of new media methods and technology.

> Collectively, members occupy a strategic position in Europe at the interface between the labour market and the educational system. Through coordinated cooperation EADTU, as a network, is instrumental in bridging the gap between the demand for the supply of educational facilities, eg. transfer of courses from one country to another. In 1989 EADTU published a report 'Toward a European Open University.' On the basis of this report EADTU is now committed to collaborative activities to establish the infrastructure for the European Open University Network (EADTU, 1992).

The infrastructure is yielding learning communities within and between the 12 European Countries (Bates, 1989).

Pacific Rim countries are also implementing distance education. The Southeast Asian Ministers of Education Organization (SEAMEO) the project "A Scenario for Education in Southeast Asia in the Year 2015." Building Scenarios for Education in Southeast Asia: The SEAMEO INNOTECH Experience has identified distance education as a major thrust in the immediate future (Habana, 1993).

Niann Chung Tsai (1993) developed a strategic plan for alternative education at the World College of Journalism and Communication (WCOJC) in Taipei, Taiwan. The strategic plan has been submitted to the Ministry of Education. The plan identified the Telecommunications program as the first to be converted to a non-traditional format, a program that could become both "ends" and "means" for communications

Member Institutions of EADTU
Sweden
Swedish Association for Distance Education Umeå, Est. 1984
Norwegian Association for Distance Education Oslo, Est. 1984
Finland
Norway
Republic of Ireland
Finnish Association for Distance Education Espoo, Helsinki, Est. 1991
National Distance Education Centre, Dublin, Est. 1982
Jysk Aabent Universitet, Aarhus, Est. 1982
Denmark
Open universiteit, Heerlen, Est. 1984
United Kingdom
Open University, Milton Keynes, Est. 1969
The Netherlands
FernUniversität, Hagen, Est. 1974
Belgium
Germany
Studiecentrum Open Hoger Onderwijs, Leuven, Est. 1987
Deutsches Institut für Fernstudien an der Universität Tübingen, Est. 1967
France
Fédération Interuniversitaire de l'Enseignement a Distance, Paris, Est. 1987
Universidade Aberta Lisbon, Est. 1988
Spain
Portugal
Universidad Nacional de Educacion a Distancia, Madrid, Est. 1972
Italy
Consorzio per l'Universita a Distanza, Cosenza, Est. 1984

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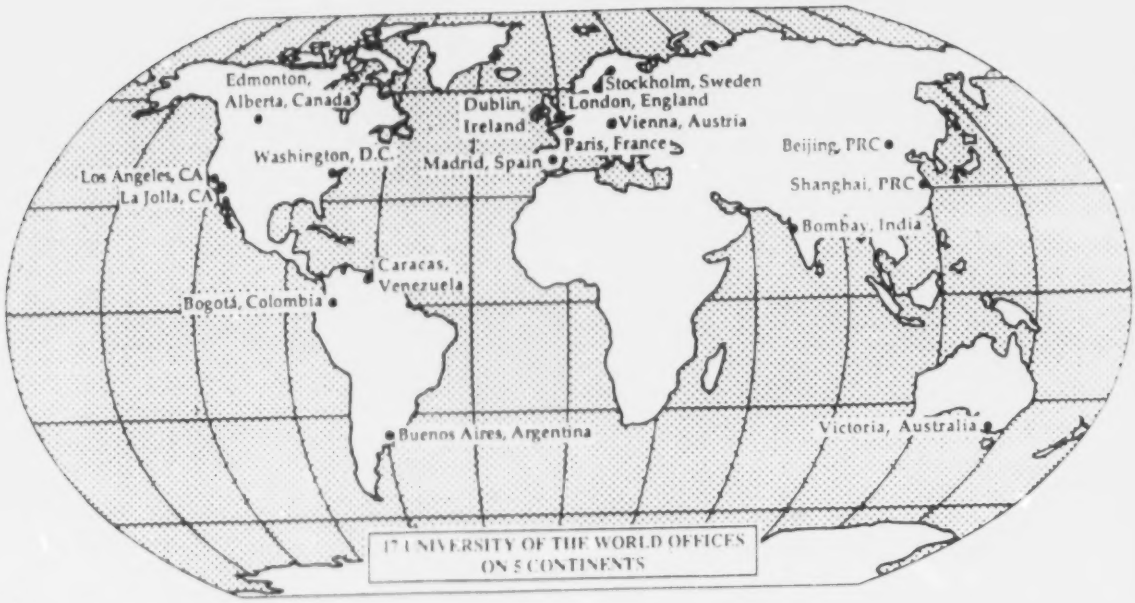
infrastructure. Only the Open University in Taiwan provides alternative education in that nation.

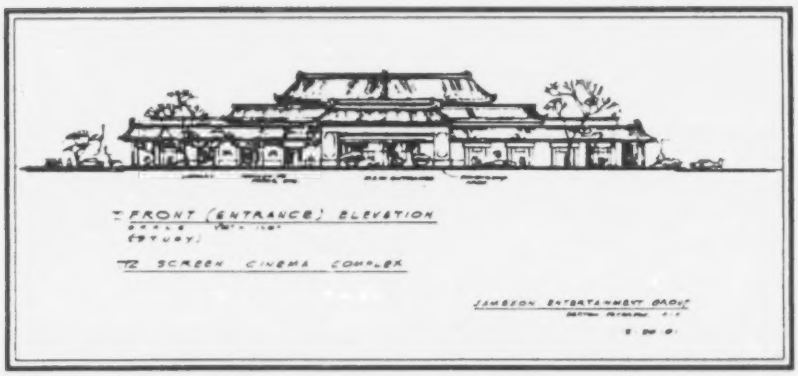
The University of the World, with a central office in La Jolla, CA, has been a major coordinator of distance education. UW announced in July 1993 the establishment of a worldwide Clearinghouse for distance education courses. Course information can be obtained by an e-mail request to the Internet address UNIVWORLD@UCSD.EDU (Newsletter, 1993). Some of the courses listed in the Clearinghouse are offered by the National Technological University, Fort Collins, CO.

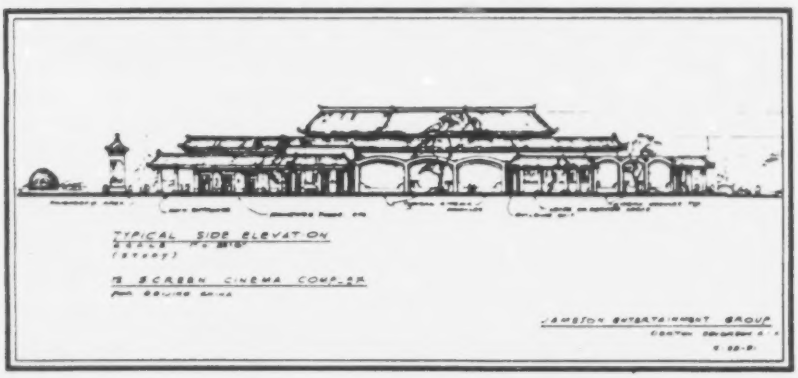
In July 1992, UW and Jameson Entertainment Group (JEG) announced plans for 50 entertainment and educational complexes in the People's Republic of China (Newsletter, 1992). Four of these large entertainment and educational complexes are slated for Beijing, with UW providing local and distance education programming and other services in at least one of them. The ground floor will have twelve 185 seat theatres, in groups of three on each side of the building. The second floor is expected to be dedicated to educational needs, including classrooms, computer rooms, and a multimedia center (see Attachment 22). JEG plans to build entertainment/educational complexes on every continent of the world. It is possible that UW will have offices in each country which has such complexes. UW could become the largest single provider of alternative distance education from outside the country in which services are provided.

Common threads of the examples in this section of the document include (a) partnerships, (b) collaboration, (c) outreach, (d) community, and (e) technical assistance. Global commerce provides the impetus for the private sector to go beyond adjusting to circumstances to higher levels of designing and shaping the future. The private sector corporations that compete successfully have (a) acknowledged the centrality of **learning to learn**, (b) positioned **human rsources development** entitlements for each employee near the top of the list of priorities, (c) created a corporate climate and culture for **lifelong learning and literacy** and (d) developed an **education and training infrastructure** to meet its needs through contemporary technology with world class benchmark standards, and do it "just-in-time."

The Twilight of Sovereignty (Wriston, 1992) is a description of how communication and inforamtion technology is radically changing the world. The window of opportunity that is open lies in increasingly informed citizens liberated by an information explosion that defies boundaries which include the traditional disciplines and hierarchial organizations. Direct dissemination of information to consumers has enormous implications for restructuring.







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ORGANIZATIONAL DEVELOPMENTAL TASKS

During the America 2000 satellite town meeting on "Lifelong Learning and Literacy," Edward W. Bales, director of education for Motorola University, said that changes are happening so quickly in the workplace, the current education system can't keep up. "Educate America" is a challenge to overcome a crisis in imagination (Myers, 1993) through an education "Desert Storm" (Rose, 1993) for (a) re-engineering traditional education and (b) creating entirely new info era "full service" communities. Each district, region and state must become a learning community and raise the level of understanding about the mind and systems.

Learning Communities for Strategic Thinking

"Community" means a climate or culture to be created (Groff, 1987; Building Communities, 1988). It means a "mind set" of rethinking beliefs, principles, and values to create conceptual frameworks that go beyond the contemporary traditional ways of looking at things. The process technology of strategic planning can assist groups to go beyond contemporary traditional establishments if it is matured to a high level of designing and shaping the future. Such an effort requires a genuine partnership of a broad range of stakeholders, consumers and providers, who are dedicated to inventing learning communities that strive for "full service" benchmark standards for improved "quality of life for each." A unity of purpose "To design and perfect the human resources development system to produce the knowledge workers of the 21st Century who have zero defects" will require a commitment far greater than landing a man on the moon and returning him safely to earth.

The ultimate outcome to any strategic thinking process is a vision and action plan that is the output of extensive deliberations about the extrapolation of historical and contemporary data that will lead to intelligence about life and work in the 21st Century. A strategic thinking process for expansion and modernization is necessary, but insufficient during the 1990s. The 1950s and 1960s were decades of expansion. Business and government expanded research and development that yielded new "goods" as well as ways to produce them which required new services. Education was asked to provide better prepared workers and culturally diverse workers. One new community college per week was added one year during the 1950s. The 1970s and early 1980s was a period of modernization when new technology was adopted by industrial era establishments first in the manufacturing and then in service sectors of the economy. Private sector manufacturing establishments began to create strategic alliances and partnerships and began to fundamentally restructure in the 1980s. The contextual analysis of the "external" environment must include an

extensive critique of research and development, new goods and ways of producing them, services which are needed, and the competencies and skills which will be required in an advanced technical era.

The U.S. has created a public and private sector research and development infrastructure that is unparalleled in history. The U.S. government alone funded $25 billion in R & D at 700 centers employing 100,000 scientists and engineers in 1991-92. Over 200 centers belong to the Federal Laboratory Consortium (FLC) for Technology Transfer that was formally chartered by the Federal Technology Transfer Act of 1964. FLC conducts research in agriculture, commerce, defense, energy, health and human services, science, space, technology, transportation, etc. The Defense Advanced Research Projects Agency (DARPA) spends more than $300 million each year on "dual-use" technology that has both civilian and defense applications. DARPA was the agency that first funded the early generation of super computers in the 1950s and 1960s. DARPA is being geared toward dual use projects such as research in semiconductors, high-definition display technology, etc. R & D for the military is being fundamentally restructured. What military engine R & D can be used for cars and trucks? What aeronautics R & D can be used in civil aircraft manufacturing?

National Aeronautics and Space Administration has been working on satellite communications since 1960. Since the early 1970s the Europeans and Japanese have poured billions of dollars into competing programs in an effort to dominate an international satellite communications market. NASA's Advanced Communications Technology Satellite (ACTS) Program is an effort to push the U.S. ahead of European and Japanese competition. A NASA satellite is testing new technology for the way in which companies do business in 19 regions.

U.S. Technology Policy, Emerging Technologies: A Survey of Technical and Economic Opportunities, and Gaining New Ground by the Council on Competitiveness provide insight into strategy for economic development. Gaining New Ground states, "There is broad domestic and international consensus about the critical generic technologies driving economic growth." Critical areas include information technologies, computers and software, and telecommunications.

The private sector investment in R & D is many times that amount and sometimes is geared for multi-national utilization. The intent is to create break-through science and technology and to distribute products and services more quickly than competition and realize the benefits -- jobs, standard of living, quality of life, profits, power, etc. New Jersey has 25 Fortune 500 corporations, New York has 53, and Pennsylvania has 29. In addition, many medium and small

corporations engage in basic and applied research. Also, many states also fund R & D and the transfer of technology.

Research and Development (R & D) drives the economy and technological change. R & D applied appropriately produces competitive advantage and creates jobs. R & D is either within or outside the private or public structure, intrapreneurship or entrapreneurship. Technological change produces new workforce and workplace needs and has major implications for learning - prior to work, for current workers, and for retraining dislocated workers. The Edison Project in Ohio, begun in the late 1970s, is intended to (1) accelerate the transition from a postindustrial era to an early technical era and (2) minimize the dislocation of the economy and people. Both goals require an understanding of (1) the R & D cycle, (2) new product development, (3) organizational development (Groff, 1983)(see Attachment 23).

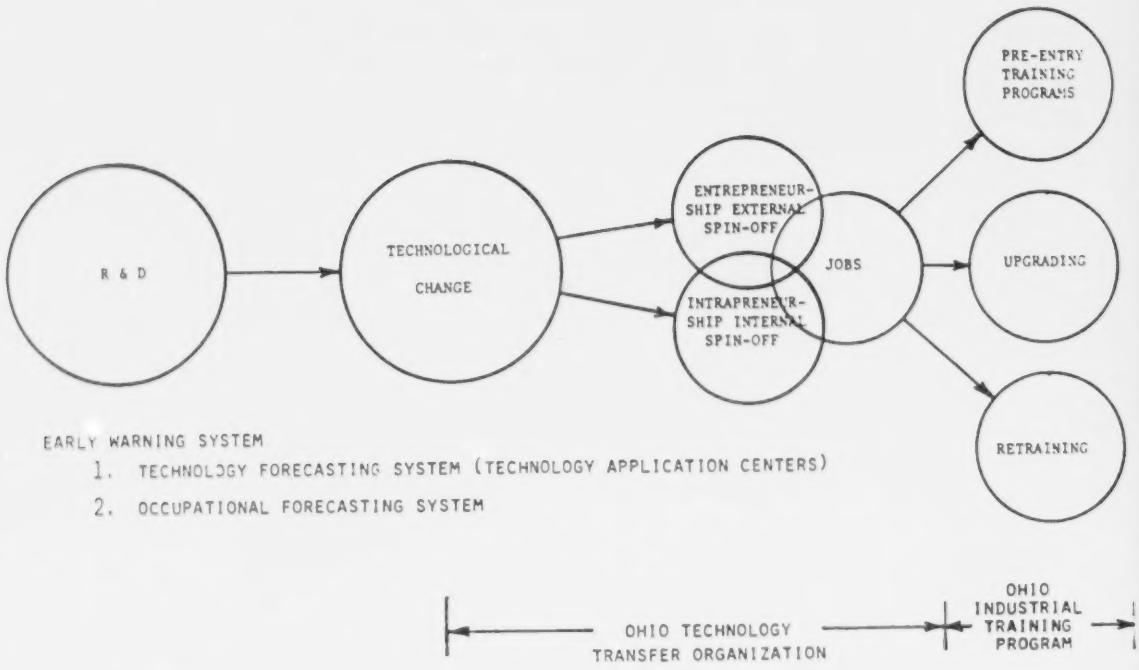
Where would the "intelligence" come from to create visions of the future and the Learning Community preferred scenario? In Risk and Other Four-Letter Words, Walter Wriston (1988) states:

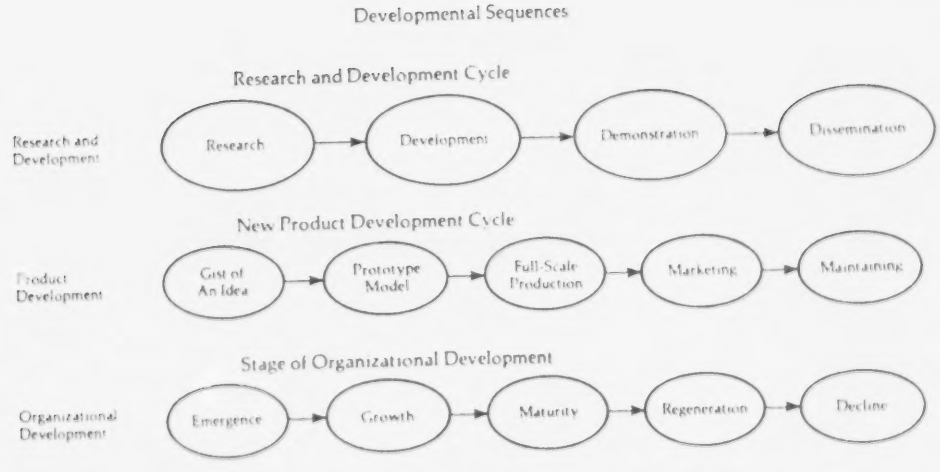
> The most accurate predictions of the future have come from science fiction writers and others with the courage to dream. Those who have relied on scientific research have almost always missed the mark. Much of what Jules Verne prophesied 100 years age has come to pass. However, a presidential commission appointed by Herbert Hoover in 1929 to forecast developments through 1952 employed 500 researchers and failed to even mention atomic energy, jet propulsion, antibiotics and many other significant developments.

The best approach is probably a combination of both methods, trend analysis and extrapolation and artful creative dreams.

Sources of trend analysis would include R & D, the Council on Competitiveness, SCANS, Work in America, the U.S. Congress Office of Technology Assessment, Project 2025, National Science Foundation Project 2061, American Society for Training and Development, Federal Library and Information Center, Coalition of Networked Information, Satellite Broadcasting, National Technology Information Services, NSFNET, Office of Educational Research and Improvement, the Trend Analysis Program of the American Council of Life Insurance, and many more. A Learning Community could form a Trend Analysis Council on Science and Technology to assess, audit, envision future, shape policy, and coordinate an academy for HRD (see Attachment 24). What R & D is occurring in private and public sectors? What are the long term implications of R & D and the impact on workplaces and workforces? What are the competencies and skills which will be required in workplaces of the future?

THE RELATIONSHIP BETWEEN R & D AND ECONOMIC DEVELOPMENT





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49B

FROM TREND ANALYSIS TO RESTRUCTURING HUMAN RESOURCES DEVELOPMENT SYSTEMS

1992-93 1993-94 1994-95 1995-96

Federal Laboratory Consortium
Private Sector Research & Development
Council on Competitiveness
Depart of Labor SCANS
Work In America
Office of Technology Assessment
Project 2025
NSF Project 2061
American Society for Training & Development
Federal Library & Information Center
Coalition for Networked Information
Satellite Broadcasting
National Technology Information Services
NSFNET
Offices of Ed Res & Improvement
Trend Analysis Program

TREND ANALYSIS COUNCIL

DIRECTORS OF RESEARCH AND DEVELOPMENT

UNITED WAY OF AMERICA

LIBRARY AND INFORMATION SERVICES

ECONOMIC DEVELOPMENT REPRESENTATIVES

AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT

WORLD FUTURE SOCIETY

DEPARTMENT OF LABOR

CENSUS BUREAU

OFFICE OF TECHNOLOGY ASSESSMENT

Learning Communities of Service Providers

Education has a unique role to play in creating learning communities because (a) learning to learning should be its primary business and (b) it is an institution that society expects will prepare the critical mass of people and know-how to help establishments function in the world of which U.S. society is a part.

An examination of planning processes in various contexts provides an evolutionary perspective and insights about the next increment of growth. North Central Technical College began planning in 1977 with the help of 200+ program advisory members. The Mansfield City Schools, Newhope, and United Way Mansfield used a similar strategy. The strategy was based on data with extensive deliberation on the extrapolation of information to produce intelligence. The primary outcomes were related to mind, human resources development, and better understanding of systems in business, engineering, health, and public service.

Restructuring was beginning to occur in the late 1980s. The Annie E. Casey Foundation recognized the need for new approaches to dealing with society's problems and funded "New Futures" projects in 1988 in Dayton, OH; Lawrence, MA; Little Rock, AK; Pittsburgh, PA; and Savannah, GA. The Robert Wood Johnson Foundation and the Pew Charitable Trusts funded restructuring projects. A request for proposals in 1988 resulted in funding for 80 one year grants to plan for restructuring nursing services in 1989-90. The planning grants yielded 20 multi-year implementation grants. These projects were among the first that attempted to focus on fundamental restructuring in the service sector.

An analysis of restructuring led to scenario creation beyond contemporary traditional education. An institution in Texas created partial technological and technology intensive scenarios in 1990. In 1992, institutions in Arizona and Nebraska used the categories of contemporary traditional education (CTE), partial technological deschooling (PTD), collaborative lifelong learning (CLL), and solution based learning (SBL). Both of these projects used content expertise and planning style preferences as measured by a modified Myers Briggs tests which classifies participants as strategic humanists (SH), strategic planners (SP), pragmatic humanists (PH), and pragmatic managers (PM).

The research on medical schools using problem based learning is convincing. Furthermore, research about distance education through contemporary technology indicates high quality outcomes. Could partial technological and technology intensive scenarios be developed to attract more culturally diverse applicants into health professions?

Healthy America: Practitioners for 2005 (1991) presents an agenda for U.S. health professional schools:
(a). Create a vision,
(b). Validate clinical practice,
(c). Improve linkages,
(d). Career mobility, and
(e). Renovate accreditation.
A subsequent publication provided more specificity about "The Challenge to Education" in preparing "Practitioners for a Different Future" (Health Professions, 1993).

Several indicators suggest that the U.S. must implement bold and creative strategies in a proactive manner to address some of its intractable social problems and prepare better and more care givers and service providers. The report on immunization is but one indicator of severe problems. Nationally, less than 60% of all children were fully vaccinated at age 2 in 1992 (Powers, 1993).

Allied health and nursing occupations are essential. These "front line" providers are primarily strategic humanists, develop conceptual frameworks, focus on holistic care as a team, tend not to succumb to technophobia, and need more culturally diverse care givers in career ladders.

The University of Medicine and Dentistry of New Jersey (UMDNJ) is the largest free-standing Health Care University in the U.S. UMDNJ is divided into seven separate schools: the Medical School, the Dental School, the Graduate School of Biomedical Sciences, the School of Osteopathic Medicine, the Robert Wood Johnson Medical School, the School of Nursing and the School of Health Related Professions (SHRP). SHRP offers educational programs in selected health professions at all levels as outlined by the Health Professions Master Plan of New Jersey. SHRP has been given the charge of expanding the educational capacity of the UMDNJ. SHRP and UMDNJ could create a plan of outreach by
(a). Assessing evolving technologies that can be used in patient diagnosis and care,
(b). Assessing technologies that can be used in health promotion and distance education for culturally diverse people, some of whom live in sparsely populated areas,
(c). Analyzing strategies to deliver health promotion strategies through distance education to culturally diverse people in remote areas of N.J., and
(d). Analyzing delivery systems to link schools in N.J. to promote career laddering at an early age.
What new technologies are being developed by Franklin Electronic Publishing, Verbex, and other corporations to promote health and rehabilitation services, improve diagnostic and developmental disability services, or deliver education and training? What could be the blueprint of specifications to link SHRP with the Camden County High Tech High School and agencies and schools in other locations?

Learning Communities for Literacy and Productivity

Reports by the National Education Goals Panel and the report on literacy point to the need for a "Morrill Act" type strategy suggested by James Botkin, Dan Dimancescu, and Ray Stata in Global Stakes in 1982. The National Education Goals Panel indicated that America isn't likely to achieve a single goal by 2000. Nebraska Governor Benjamin E. Nelson stated "Our progress is wholly inadequate" (NEGP, 1993).

The U.S. is evolving a definition of "literacy" that started with reading comprehension and was expanded to other communication and computational skills. Over the past 20 years, generic and specific technological competencies have emerged as a new area of study (Dyrenfurth, 1984; Groff, 1986; and Yff, 1983). Adult Literacy in America (Kirsch, 1993) used a broad definition of literacy, attempting to assess adults' ability "to use printed and written information to function in society" as well as their capacity to perform everyday functions that involve simple arithmetic. The study found 47% of adults lack literacy needed for work. U.S. Secretary of Education Richard W. Riley said "This report is a wake-up call to the sheer magnitude of illiteracy in this country and underscores literacy's strong connection to economic status. It paints a picture of a society in which the vast majority of Americans do not know that they do not have the skills they need to earn a living in our increasingly technological society and international marketplace" (Literacy, 1993).

The Delaware Valley and New Jersey Route 1 are poised to be knowledge producing centers in restructuring. The New York-Philadelphia-Wilmington segment of the Boston to Washington corridor is home to some of the most advanced health care establishments and headquarters for a great many multi-national corporations and new enterprises that produce and use the technologies that are critical in the 21st Century. These companies must "communicate" the application of their goods and services to many different consumers. The Delaware Valley is an ideal location to create models of 2020 full service learning environments based on advances in the cognitive sciences, mind, and communication and information technology, systems.

Leaders have begun to realize the centrality of the brain and research in the cognitive sciences. Scientists can now peer into the human brain through magnetic resonance imaging (MRI) and observe changes that occur as the mind works (Begley, 1992; Blakeslee, 1993; amd Gelman, 1992). Imagine being able to observe cogitive synapses while a human is engaged in the inputting, processing, and outputting information such as the integration of math, science, and technology.

Research and development has yielded communication and information technologies that have made it possible to transmit data, video, and voice instantaneously and simultaneously almost anywhere in the world. The ATM (Asynchronous Transfer Mode) fast packet switching technique to transmit data in short, fixed size cells at 1,000 times greater than the 1992 rate is a major breakthrough advance that has tremendous implications for restructuring work. IN CUBE Voice Command for Sun workstations that incorporates advanced real time speech recognition software. Imagine talking to your workstation using thousands of your own customized voice commands that are instantly recognized and translated into your own functions (Mikes, 1993). IN CUBE is being used by hundreds of private and public sector establishments.

Other technologies are important. By combining Optical Character Recognition with a voice synthesizer, the Reading Edge scans and recognizes text from documents, books, or electronic fax files, then reads the text aloud to users. The languages that can be read are English, German, Spanish, French, Norwegian, Swedish, and Italian. Each is available on a SmartCard. Furthermore, a corporation in Nebraska has developed software to translate English into Chinese. Breakthroughs will occur with other languages of Pacific Rim countries. Imagine applying this know-how and technology to improve communication to culturally diverse families for literacy related to readiness for parenting, readiness for preschool, or readiness for work.

The New American Schools Development Corporation (NASDC) funded the Community Learning Centers (CLC) project in St. Paul, MN. The CLC project used 10 focus areas to progress through thinking strategically about the design process to identify preliminary and advanced research that would be needed to create CLCs and then replicate them. The 10 areas were brain based learning, people oriented, world as campus, progressive curriculum, major use of technology, integrated social services, hub of activity, headquarters for learning, staffing alternatives, and site managed (see Attachement 25). The CLC project completed the initial planning year, 1992-93. CLCs are being implemented in several designs in six sites that will operate year round, 24 hours a day, for all ages. Comprehensive Learning Centers were created throughout the 1980s to help education mature from generic batch processing "education for all" to customized "learning for each." Several educational institutions have accepted the learning for each philosophy and are now delivering "open entry - open exit" programs and services to a majority of students with profound impact on student learning outcomes and retention. Within a decade, the know-how of the Comprehensive Learning Center has been applied to Community Learning Centers (Design, 1993).

COMMUNITY LEARNING CENTERS

Headquarters for learning
- Open year round, day and night
- Well provisioned

Brain based learning
- Experiential
- Stimulation
- Safe and secure
- Learning vs. teaching paradigm

Progressive curriculum
- Curriculum = all experiences
- Strengths and success oriented
- Personal growth plans
- Thematic, interdisciplinary

Hub of activity
- Engaged learners
- Projects of all types
- Learning labs, studios
- Exploration and inquiry centers

Major use of technology
- Computers: WP, SS, DB, Graphics,
- Video studios and satellite reception
- Discourse lab
- Radio station
- Printing and publishing

World as campus
- Door swings both ways
- Use deep reservoirs of talent
- Learning expeditions
- Traveling classrooms
- Exchanges

Integrated social services
- Co-location
- One-stop center for services

People oriented
- All races, all ages
- All are learners, all are teachers
- Every person celebrated and respected
- "Can-ness" oriented

Site managed
- Stakeholders make decisions
  - Budget
  - Program
  - Staffing
- Teachers: decision makers
  - With accountability
- Quality emphasis, client oriented
  - Do it right first time
  - Accelerate, don't remediate

Staffing alternatives
- Professional and paraprofessionals
- Facilitators, orchestrators of learning
- Students as resource
- Community resources
- Teacher training: alternate route
- Contracted services

How would a region create a learning community to think strategically about a next generation CLC that would use contemporary research about cognitive synapses and electronic networks and focus on literacy and productivity? Because education is essentially a state function in the U.S., a governor or group of governors could initiate partnerships with private sector establishments to create learning communities. Governor's Superschools (Toch, 1993) could be created in a manner somewhat similar to those created by the NASDC. Teams of consumers and providers could be appointed to subcommittees for each of the 10 above-mentioned or other categories. The teams could include consumers of all ages and cultures, including gifted and talented Jules Vern nintendo types. "Gifted kids are bored by U.S. schools" (Henry, 1993). What has happened to talented students in science is a disgrace (Tobias, 1992). They are uninhibited and unintimidated by "scholars" and technology. Classical definitions of gifted and talented would be set aside for informed judgment and representation. The teams would have an orientation on (a) unity of purpose, (b) developing the specifications, and (c) technology. The teams would create the specifications via ATM and IN CUBE type technology as well as accessing experts through NSFNET, Internet, and systems (Krol, 1991, and Braun, 1994).

One of the CLCs would be for global health and wellness promotion through contemporary graphic communications. The rationale is humanistic and economic. The gap between the "haves" and "have nots" in the U.S. is increasing with devastating impact on nutrition and well being of young children and single head of household families. The U.S. must become more serious about correcting more conditions as early as possible. Detecting and correcting deficiencies as early as possible will increase the likelihood of having a higher performing learner and worker for a longer period of time.

The group on "brain based learning" would synthesize the research of neuroscientists, cognitive scientists, and experts on learning styles; the group could investigate advances being made in MRI technology. The "people oriented" group would examine caring and sharing environments and collaborative learning (Bruffee, 1993).

The "world as campus" group could identify important elements in understanding other countries as they relate to health and wellness. What products are made by Johnson and Johnson, Campbell Soup, and other corporations that can be used to improve nutrition and quality of life? How can the graphic communications promote literacy, understanding the value of products, and improve productivity? Significant as that gap is in the U.S., it pales in comparison between the "have" nations in the North and the "have-nots" in the South, based roughly on the Tropic of Cancer with a few

exceptions. Four out of five people live below that line. The Population Crisis Committee reported harsh suffering in 83 countries with 73 percent of the world's population in areas where conditions are extreme such as in Mozambique, Somalia, Afghanistan, Haiti, and Sudan (Brisco). "Today the 23% of the Earth's population living in the developed nations use two-third of the world's energy output - and cause three-quarters of its pollution" (Wagman). It is essential that the have nations respond to quality of life issues of the have not nations. Strategies and techniques could be pilot tested with impoverished groups in the U.S. and then delivered elsewhere by culturally diverse people who have roots in other countries.

The "progressive curriculum" group would deal with three formats: content, delivery system, and evaluation format. Traditional curricula impose constants of time and instruction requirments with student achievement as the variable. Student achievement is the constant in the competency based format while instruction and time are variables. Outcomes based education is built on the idea of student achievement in relation to absolute standards. The progressive curriculum group would analyze competencies and standards information from the national organizations that have set generic standards, the American Society of Training and Development, and the occupational skills projects and create the curriculum for a Certificate of Initial Mastery (CIM) and a Certificate of Advanced Mastery (CAM). The PC group would collaborate with the use of technology group on (a) content technology in health and graphic communications and (b) curriculum delivery system technology.

Several individuals and states are pioneers in OBE. William G. Spady has elevated OBE to a higher level. The International Center on Outcome-Based Restructuring sponsored by the High Success Network on Outcome-Based Education and the National Association of Secondary School Principals (NASSP) could help in an effort to shift away from time based indicators of school success to other measures of output. Minnesota, Nebraska, and Pennsylvania have adopted OBE. School districts in Pennsylvania must engage in strategic planning to implement OBE. The strategic plans must contain an HRD component. Guidelies are being developed for various aspects of OBE including technology education at the elementary, middle, and high school levels (Technology, 1993). Technology awareness is the focus at the elementary level. Technology education at the middle school level is on (a) exploring, (b) applying, and (c) creating technology (Pecosh and Gemmill, 1993). Understanding the entire system at the secondary level includes (a) communication (b) transportation, (c) manufacturing, (d) construction, and (e) bio-related technology.

The "major use of technology" group would develop the specifications for the delivery of the curriculum. Digital formats, electronic publishing, and multimedia have redefined "instructional materials" and delivery systems (Greenfield, 1993). What are the specifications for a futuring seminar that can be delivered electronically into community agencies, homes, public libraries, schools, and workplaces? What are the specifictions of an "Imagine Your Tomorrow" program for career exploration? What are the specifications for a "ClariNet" type electronic bulletin to connect the Super School on Health and Wellness to community agencies and other educational institutions? What are the specifications for a "department chairs" network similar to the Apple pilot program (Morgenster, 1993). What are the specifications for a freenet? What are the specifications for the on-line working group on collaborative learning? What are the specifications for the system to link the CLC to private sector partners? What are the specifications to link to the R & E Council of the Graphic Arts Industries, the Graphic Arts Technical Foundation, and the National Association of Printers and Lithographers based in Teaneck. What are the specifications to link to the New Jersey Intercampus Network, particularly Rowan, Kean, Montclair, and Trenton with teacher education programs in technology with some emphasis on graphic arts (see Attachment 26)?

Each of the teams would develop the specifications and chart the multi-year action plan for implementation for the CLC on health and welfare through graphic comunications.

Cognitive scientists would evaluate the process of designing and implementing the CLC. Research evidence exists about learning within contemporary traditional education and on problem based learning in medicine. Very little good research exists about learning outside CTE. There has been a great increase in home study during the past two decades and several of the students have graduated with very high standing from excellent colleges. Many students are experiencing distance education (Office, 1993).

Other CLC would focus on communication systems with emphasis on digital and fiber optics (Kupfer, 1993).

> Corning, the No. 1 maker of optical fiber, estimates that if telephone companies upgrade aging installations at their historical pace, the rewiring will will take until 2037. But Japan is committed to completing a national fiber network by 2015 and believes that the resulting productivity gains will boost GNP by bo less than 30%. Germany and France are not far behind in their plans.

Singapore, Japan, Hong Kong, and France are virtually 100% digital. The U.S. is only halfway digital (Helm, 1993). Japaneese engineers are testing a fiber optic network that

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New Jersey Intercampus Network (NJIN)
Video Network Phase I

DOWNLINK SITES

1. Ramapo College of New Jersey
2. Sussex County Community College
3. William Paterson College
4. Bergen Community College
5. Montclair State College
6. County College of Morris
7. College of Saint Elizabeth
8. Fairleigh Dickinson University
9. New Jersey Institute of Technology
10. Essex County College
11. Drew University
12. Caldwell College
13. Kean College of New Jersey
14. Stevens Institute of Technology
15. Saint Peter's College
16. Seton Hall University
17. Union County College
18. Raritan Valley College
19. Rutgers, The State University
20. Brookdale Community College
21. Princeton University
22. Mercer County Community College
23. Trenton State College
24. Thomas A. Edison State College
25. Burlington County College
26. Georgian Court College
27. Gloucester County College
28. Ocean County College
29. Richard Stockton State College
30. Cumberland County College
31. Atlantic County College

NJIN/NJN Backbone

Origination/Downlink Sites

NJN Transmission Tower

Downlink Sites

10/91

will allow households to use videophones and watch theater quality images sent over the same lines.

Another CLCs could be in Transportation Systems with a focus on **automobiles**. President Clinton has already formed strategic alliances to produce the 80-mpg car and (Herbert, 1993). The White House hopes that the government-industry project will begin to produce fuel eficiency and polution control technology that automakers can phase into production processes. The project would shift several hundred million dollars in money that goes into defense related programs.

Another CLC in the Transportation and Manufacturing Systems categories could focus on **aerospace**. President Clinton is supporting aviation research (Stewart, 1993).

> U.S. aircraft manufacturers have seen their world market share erode at an alarming rate. In 1969, they built 91% of the civil aircraft sold world-wide. Today, the industry is struggling to maintain 67% market share.

The goal would be to produce a plane that can be commercially manufactured by 2005 that would accomodate up to three times as many passengers as the existing supersonic Concord atroughly one-ninth of the cost per passenger mile.

The Franklin Institute, Greater Philadelphia Economic Development Coalition (GPEDC), and the Technology Council of Greater Philadelphia (TCGP) could become major partners to create CLCs. The Franklin Institute has extensive experience with know-how and technology transfer through teacher education and inservice. In addition, with Drexel University and TCGP has proposed "The Greater Philadelphia Consortium for Science and Technology Education and Training: A Public Private Partnership." GPEDC has a regional database index of major sources of information including (a) health care and (b) advnced materials (Greater, 1992). TCGP has a twofold purpose:

> We exist to help regional companies introduce more products into more markets faster, using more regional technology. We also place a priority on transferring knowledge and technology, in order to make small and large companies and our regional universities more globally competitive.

Each CLC would include **graphic communication** because of the need to better understand basic communications for culturally diverse people and to learn more about how to increase literacy and improve productivity. The proposed CLCs do not approximate the challenge necessary to interdigitate all education, health, and social services in a community, region, or state.

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Leadership and Human Resources Development Academy

We are privileged to live during an extraordinary period of time, the transition to a new era with entirely new frontiers to be explored. The emergence of the agricultural era was based on primitive technology and took hundreds of years. The evolution of the industrial era was based on more complex technology and also took a rather long period of time. The evolution of the early technical era is based on much more complex technology and is taking only a relatively short period of time. Providers and trustees were "schooled" during the expansion era and are now modernizing institutions designed for the industrial era. The evolution of the advanced technical era is based on increasingly more complex and sophisticated technology and will occur in an even shorter period of time. It is unrealistic to assume that education can merely adjust to circumstances and avoid the creation of entirely new types of learning systems for human resources development.

Leadership academies and institutes have existed for many years. The U.S. government has operated the Federal Executive Institute since 1968. The military operates the Unites States Army War College in Carlisle, PA; Air War College; Air Force Institute of Technology; Defense Intelligence College; National Defense University, and other institutions. The Center for Creative Leadership in Greensboro, NC, conducts numerous programs throughout the world primarily for private sector establishments. The LEAD (Leadership in Educational Administration Development) program was authorized by Congress in 1984 under the Leadership in Educational Administration Act, P.L. 98-558 (Moorman, 1989). Several states have leadership academies. California has a Vocational Education Leadership Academy.

The essential messages in "Learning Communities of the Future" are that (a) **America 2000 is a spirit of renewal** to rethink human resources development systems based on new know-how and technology; (b) conceptual frameworks exist to focus on health and community learning and information networks; (c) multinational establishments are using contemporary communication and information technologies; (d) when contemporary technology is applied in services the outcomes have been empowering and have yielded **greater access to improved quality at reduced costs**; and (e) strategic directions in the European Community and Pacific Rim countries include distance education through contemporary communication and information technology.

The essential messages in "Developmental Tasks and Resources" are that (a) Educate America must include bold and imaginative **"Desert Storm" strategies** growing out of strategic thinking about fundamental restructuring; (b) raising the level of awareness and understanding about

technology is essential; (c) health occupations must play a critical lead role in the well being of young children and their families which are needed as good citizens and productive workers; and (d) Community Learning Centers are a viable step toward Learning Communities of the 21st Century.

Several states have used the conceptual framework of the America 2000 goals and objectives and developed action plans for achieving high priorities with local emphasis based on need. In Nebraska, the Coordinating Commission for Postsecondary Education has adopted the goals categories and asked institutions to use the framework for planning.

Programs the Academy could focus on are the (a) mind, (b) hard technology, (c) know-how technology, (d) systems design, (e) HRD multi-media, and (f) policy (see Attachment 27). Leaders must understand how the mind functions -- **learning and visioning** -- and **systems and technology** (Carnevale, 1989 and 1992). Leaders and policy makers must understand the information era and its impact on workplaces and workforces (Hines, 1994) and "wild card" implications if Germany moved east and formed a strategic alliance with the Commonwealth of Independent States (Rockfellow, 1994). Curriculum developers need to understand the impact of **electronic publishing** as described in "Beyond the Global Village" and "Publishing for the Individual" by Joseph Dionne (1990 and 1992). Providers must understand know-how technology such as strategic planning (McCune, 1986), **needs assessment** (Cupples, 1993), **program review** (Satterlee, 1991), Total Quality Schooling (Initiatives, 1993), and TQM (Strategies, 1993; Federal, 1992; The Quality Revolution, 1993, and Ziemba, 1990). The National Quality Academy of the National Institute for the Advancement of Educational Research and Innovation holds potential for expanding TQ know-how (Wiggenham, 1990). Some programs could be unique to the Newark-New York area and some could be unique to the Camden-Philadelphia area.

The Academy could create **new learning environments**. A state could determine that **readiness for school** would yield a high **return on investment** and create programs for the three objectives. There is considerable restructuring that is occurring in the beginning caring and learning environments. A **ROOTS** commitment at state, regional, or local levels to such a project could be coordinated by an Academy and use resources such as "Next Decade Strategies" (Kagan, 1990), New Partnerships (1990), The School of the Twenty-First Century (1990), The Forgotten Half (1988), What It Takes (1991), Kindergarten Policies (Peck, 1988), Building a Community for Learning (Brant, 1992), Building Communities Through Strategic Planning (McClenney, 1991), Education-Community-Business Partnerships (1992), Together We Can (Melaville, 1993), and Recrafting the Business of Schooling (1993) (see Attachment 28).

Leadership and Human Resources Development Academy Programs

1994-5 1995-6 1996-7 1997-8 1998-9

Mind
Basic Research
Applied Research
(Problem Based Learning
at Medical Coleges)
Visioning

Hard Technology
ATM
Cellular
Communications
Digital
Distance Education
Electronic Publishing
Voice Activiated
ENHANCEMATE
IN CUBE
VERBEX

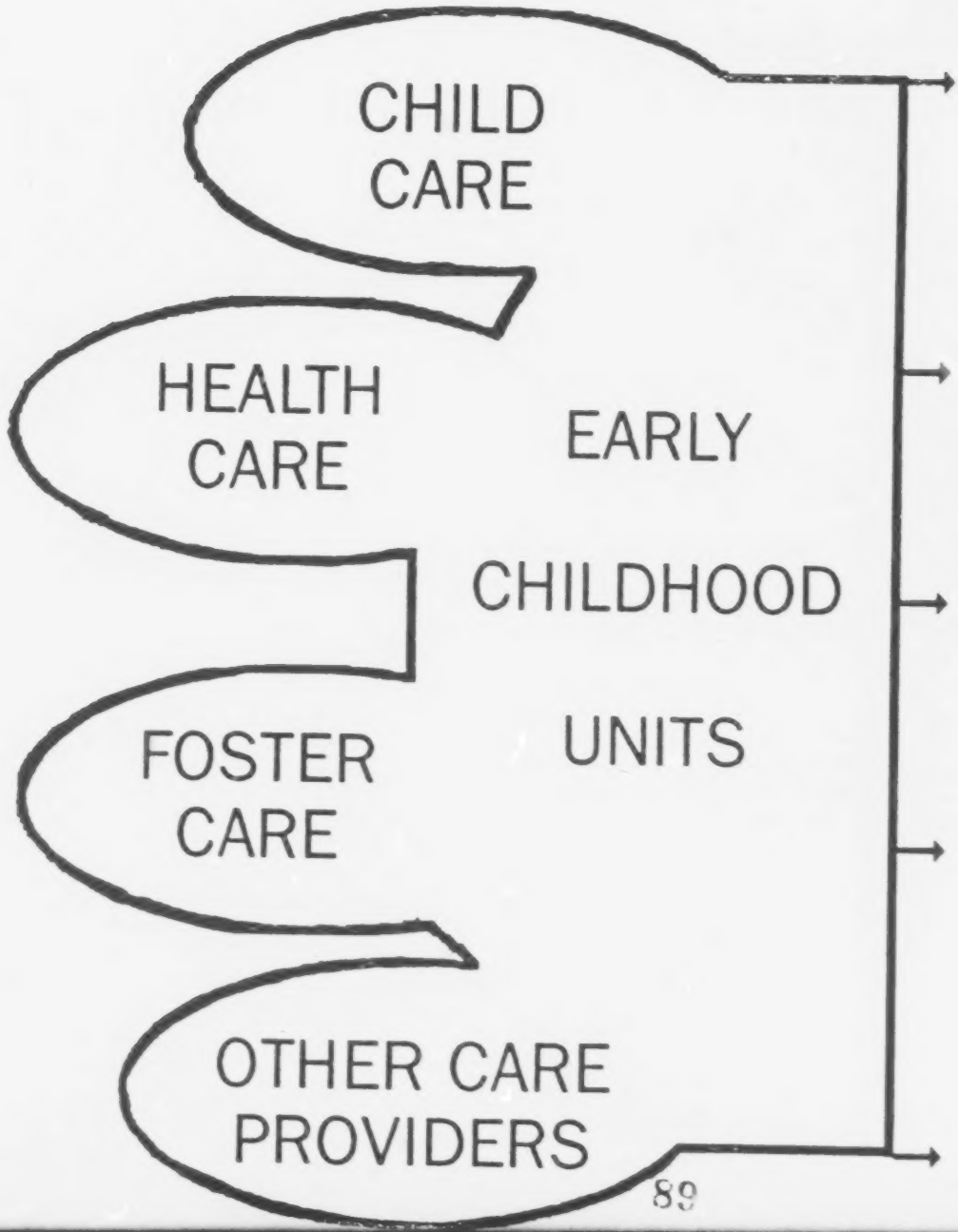
Know-How Technology
Strategic Planning
ISO 9000
Needs Assessment
Outcomes Based Educ
Performance Funding
Program Review
Site Based Management
Tech Prep
Total Quality

Systems Design
NASDC
Roots and Wings
Co-NECT
CLC
Edison Project
EduTech
Electronic Village
Libraries & Media Centers

HRD Multi-Media
Nat. Tech. Univ.
Univ. of the World
EADTU
Nova

Policy (All Levels)
Research & Development

BEGINNING CARING & LEARNING ENVIRONMENTS



A state or local priority could focus on math, science, and technology with particular emphasis on minority youth. The percent of students achieving minimum proficiency in math at the 8th grade level suggests the need for change. The Academy could facilitate the development of creative programs for a single subject or a Science, Technology, and Society (STS) articulated and integrated approach which could be used at the early and middle levels as well as for adult literacy in a traditional and an on-line format.

A **Co-NECT WINGS** project could use the resources of the Information Dissemination Program of the National Science Resources Center, the Technical Education Research Center (TREC), and the Federal Laboratory Consortium. For example, the Johnson Space Center of the National Aeronautics and Space Administration has an abundance of high quality life sciences instructional materials. A **Co-NECT WINGS** project could yield the next generation of integrated academic and vocational programs (Integration, 1993; Hull, 1992; Hull and Parnell, 1991; Stasz, 1993; and Tech Prep, 1993).

When Thomas Edison wanted to invent the light bulb, he didn't tinker with the candle. Leaders must take bold and creative steps to design alternative to contemporary traditional education. Partial technological and technology intensive education systems are being used with good success, some through the Star Schools Program or through the National Science Foundation programs. Collaborative learning programs are also maturing with similar success. **Problem based learning** has demonstrated high quality results in medicine. Is it conceivable that sufficient elements exist so that a **SOLUTION BASED LEARNING** model could be invented and pilot tested which would be patterned after the Boy Scouts increments of star, life, and eagle? Is it possible to envision a program with a curriculum guiding a learner through a **Certificate of Initial Mastery** and a **Certificate of Advanced Mastery** in a **SBL** format with didactic content offered in a Middle College High School or Community Learning Center, or on-line, and the applications component acquired in the community? Not only is it possible to envision such a model, education will be able to create such a model in the next few years. Whatever the model, at the core will be the electronic library and multimedia center (Information 2000, 1991; Perkinson, 1992; Shuman, 1989; and Stripling, 1992)(see Attachment 29).

The Academy would play a lead role in developing a **multimedia on-line capability for leadership development.** Experience in restructuring a doctoral program, for professionals who work with children and youth, that is delivered in traditional and multitech formats has provided insights about the **empowering potential** of contemporary technology. Leaders should have the opportunity to use the know-how and technology that is shaping the world in which they set policy for the child and youth in their trust.

America 2000 Goals and Objectives

1994-5 1995-6 1996-7 1997-8 1998-9

Community Learning Center Superschools

1. Readiness for School

a. Preschool programs
b. Parent as first teacher
c. Nutrition & health care

Health and Wellness Promotion
with Graphic Communications
(1) Create Vision - Major Focus
(2) Develop Action Plan

2. High School Completion

a. Reduce dropout rate
b. Reduce minority gap

3. Subjects

a. Improve performance
b. Basic skill subjects
c. Citizenship
d. Language
e. Diverse cultures

4. Science and Math

a. Student outcomes

CLC Superschools for Goals 4 & 5

Communications Systems
with Electronic Publishing

Automobiles
with Graphic Communications

Aerospace
with Graphic Communications

b. Teachers
c. Undergrad & grad

5. Adult Literacy and Lifelong Learning

a. Education and work
b. Worker knowledge
c. Programs, (libraries)
d. Enter college
e. College skills

6. Safe, Discipline, and Drug-Free

a. Drugs and alcohol
b. Entire community
c. Alcohol prevention

LEADERSHIP FOR CREATING LEARNING COMMUNITIES

The study of leadership is not new. Researchers studied Horace Mann -- his vision, what he did, how he did it, his characteristics, etc. Researchers also documented leadership in the late 1800s and early 1900s that ultimately led to the evolution of vocational education. Researchers documented leadership in the Sputnik era that began in the late 1950s which ultimately led to a variety of large scale projects including the creation of Research and Development Centers, Regional Educational Laboratories, and Educational Resource Information Centers (ERIC). Researchers have documented the **expansion** of industrial era institutions and the **modernization** of post-industrial establishments with contemporary communication and information technologies, such as the Star Schools projects.

Learning to Learn

What is new about the study of leadership relates to the recognition of the **centrality of learning to learn** as the critical technology and the need to position **human resources development** at the top of the America 2000 agenda. Technology is the means by which education will re-engineer the teaching and learning process and **restructure** existing establishments to create "Info Era Learning Communities." However, it is humans who will use the technology to (a) re-engineer existing establishments and (b) invent the next generation of learning systems through visions and multi-year action plan creation and co-creation -- **COLLABORATION** in a nation comprised of people who represent cultures from throughout the world and was formed to celebrate diversity and promote creativity and uniqueness.

Numerous experiences have contributed to a better understanding of leadership competencies that are necessary to transform industrial era establishments into info era learning communities. Several of these experiences were referred to earlier in the visions and scenario creation section in this document. No experience has been more valuable, however, that the creation and implementation of a Child and Youth Studies (CYS) doctoral program that is being delivered in **didactic and multi-tech formats**. The didactic format is nontraditional in many ways including the delivery of the sequence of learning experiences to a **cohort** of professionals to a geographic region in the United States such as the Delaware Valley. The cohort concept makes it easier to **bond and network** for **collaborative learning**. The multi-tech format provides for the use of electronic highways and other technologies to deliver part of the learning experience at each student's work station via modem and PC. More important, however, each student is **empowered with technology** which minimizes geographic, physical, and temporal restrictions.

Six years ago a small community of learners created CYS to focus on **transformational leadership** skills in areas of specialization. Ideas about transformational leadership were drawn from Burns (1978), a series of publications by the University Council of Educational Administration (UCEA), and several national organizations including the National Society for the Study of Education. Transformational leadership involves mutual stimulation and elevation of beliefs and values. One significant UCEA publication was by Cunningham and Payzant (1983) on understandings, attitudes, and leadership skills. The NSSE 1987 yearbook, Society as Educator in an Age of Transition (Benne and Tozer, 1987) was used as a textbook for a few years.

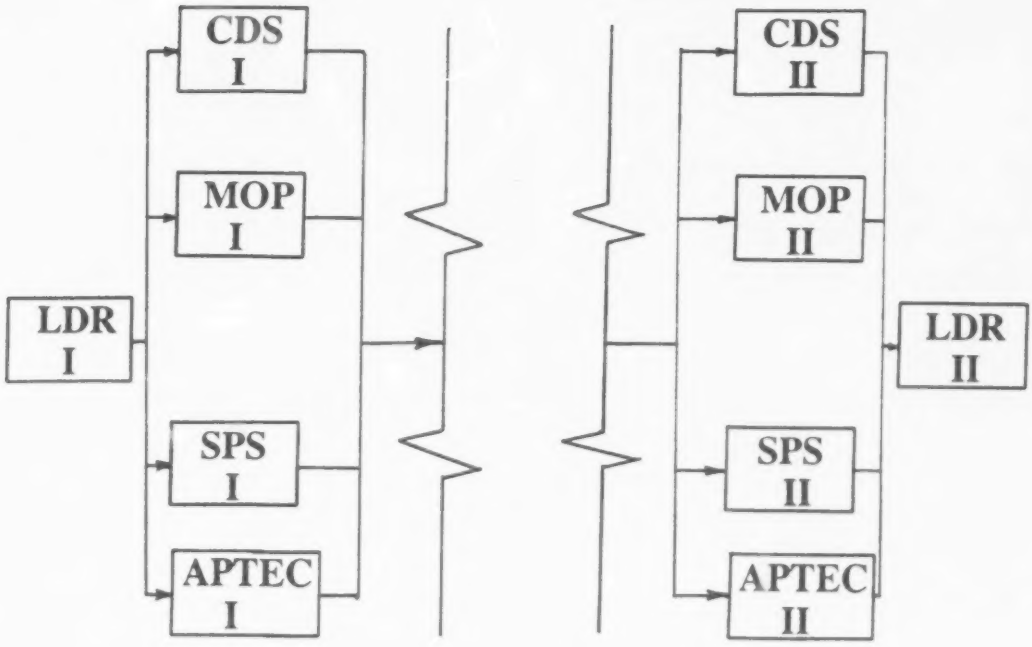
The CYS design is a simple concept -- value added between new students and graduates in transformational leadership skills in areas of specialization (see Attachment 30a). Specializations are (a) Curriculum Development and Systemic Change, (b) Management of Programs for Children and Youth, (c) Special Services for Children and Youth, and (d) Application of Technology to Education and Training. Several concepts introduced in Leadership I are built upon in specialization. For example, strategic planning is presented more fully in MOP to focus on program planning.

CYS begins with Leadership I and concludes three years later with Leadership II. Leadership I introduces students to the theoretical and philosophical foundations of leadership which are synthesized into significant concepts and implications for problems in a student's work context. Leadership I units of study include (a) societal problems; (b) leadership theory, research, and practice; (c) strategic thinking and operational planning; (d) organizational development and human resources development; (e) concepts of powerful thinking; and (f) personal and professional development (see Attachment 30b). **Personal data variables** and **scores on three tests** are obtained for each student. The data from the tests are used to provide students with insights about dimensions of **diversity and leadership** and to group students to accomplish **learning objectives**.

Each student identifies two problems which intrude on her/him and specifies a list of issues for each problem. Each student collaborates with others in small groups to specify issues for each of two problems. Problems relate to all America 2000 goals and objectives. Information about CYS includes a schedule and lists of problems and issues and is located in Appendix D. Each list must include **technology**, either know-how process technology such as strategic planning or total quality or communication and information technologies. Each student distributes a copy of two problems and the issues to clustermates who are encouraged to create a file for each problem they think may have relevance to them in the future.

OUTCOMES: OUTPUT

62A



VALUE ADDED I

	SESSION 1		SESSION 2		SESSION 3		SESSION 4
	Societal Problems	Leadership Theory/Research Practice	Strategic Thinking & Operational Planning	Organizational Development & Human Resource Development	Concepts of Powerful Thinking	Personal & Professional Development	Integration: Professional Development Plan & Journal
CDS							
MOP							
SPS							
APTEC							

Problems are classified based on America 2000 Goals (see Attachment 31a). Each student creates a Professional Development Plan (PDP) which contains (a) a brief analysis of self and work context and (b) goals and objectives linked to CYS learning experiences. Resources are identified to accomplish goals and objectives. Each student keeps a journal of significant conceptual, interactive, and technical learnings throughout CYS with particular emphasis on areas of specialization (see Attachment 31b). The PDP and journal are integrated with the latter being a record of increments of change. Each student makes an oral presentation to the cluster on one of their problems, how the **problem** is expressed in **goals and objectives** in the PDP, and the **action plan** s/he plans to pursue with resources.

Each student pursues learning activities: research and evaluation, human development, an area of specialization, political process and social issues, two practicums, and two summer institutes during which students hear many experts.

Leadership II is a demonstration of the application of the principles of leadership in the three step process: **Analysis, Vision, and Action** plan development. Each student analyzes the significant concepts and implications from the above-mentioned learning experiences and describes changes as in the model by McDaniel (see Attachment 32).

CYS started four traditional clusters (34, 37, 38, and 40) and then started national multi-tech clusters in February 1991 (46) and February 1992 (50). Two regular clusters completed Leadership II in 1991-92 (34 and 37). Two additional multi-tech clusters were started in October 1992 (54) and February 1993 (59) while two traditional clusters completed Leadership II (38 and 40). A regular cluster was started in King of Prussia, PA, at the same time a multi-tech cluster was started in winter 1993. A fifth multi-tech was started in October 1993 and a regular cluster was started in Wilmington, DE, in December 1993. Cluster taught by the author of this document are as follows:

	1989	1989-90	1990-91	1991-92	1992-93	1993-94
#34	L-I			L-II		
#37		L-I			L-II	
#38			L-I			L-II
#40				L-I		L-II
#46	National Cluster			L-I		L-II
#50	National Cluster			L-I		
#51	Alexandria, VA				L-I	
#54	National Cluster				L-I	
#57	King of Prussia, PA					L-I
#59	National Cluster					L-I
#62	National Cluster					L-I
#65	Wilmington, DE					L-I

Appendix E has the schedules for Clusters 62 and 65.

LEADERSHIP I

SESSION 1	SESSION 2	SESSION 3	SESSION 4
Problems and Issues		Professional Development Plan	PDP Addendum and Journal

1. Readiness
2. Learner Success
3. Basic Subjects
4. Math, Science, and Technology
5. Adult Literacy
6. Safe and Secure
7. Preparation of Personnel

LEADERSHIP

SPECIALIZATIONS COMPETENCIES

	CONCEPTUAL	INTERACTIVE	TECHNICAL
CDS			
MOP			
SPS			
APTEC			

ROLE CHANGES
As a Result of Participating in the Ed.D. Program

63 B

Study Area(s)	Initial Role(s)	New Role(s)
Leadership I-II	• Local Thinker • Reactive Leader • Search for Self-Identity • Realist	• Global Thinker • Proactive Leader • Self-Awareness • Visionary/Change Agent
Study Area(s)	**Initial Role(s)**	**New Role(s)**
Practicum I-II	• Organizer/Planner of Short Term Projects • Part of a Research Design (a Statistic) • Quick Fixer • Moderate Communication Skills	• Organizer/Planner of Long Term Projects • Designer of Research (Create Statistics) • Propose Long Term Solutions • Effective Communication Skills
Study Area(s)	**Initial Role(s)**	**New Role(s)**
Research/SPEC/ Tech	• Reading Educational Journals • Minimal Computer Knowledge • Conformed Educator	• Writing Articles for Publication • Expert in Computer Application • Diversified Educator
Study Area(s)	**Initial Role(s)**	**New Role(s)**
Human Development I, II, III	• Expert in a Particular Stage of Human Development • Aware of Social Issues Affecting Children • Concerned With Children in Own Work Setting	• Expert in Child Development From Birth to Age 18 • Advocate of Children • Concerned With Improving the Quality of Life for All Children
Study Area(s)	**Initial Role(s)**	**New Role(s)**
(PPSI) Political Process	• Politically Aware • Carry Out Policy • Individualist/Egocentric	• Politically Active • Policy Maker • Networker

Vision and Action Plan Creation and Co-creation

The heart and soul of CYS is **transformational leadership** in areas of **specialization**. Several different strategies have been used and evaluated to develop transformational leadership skills.

A practicum is an **APPLICATION** of knowledge to a **REAL** problem in the student's work context -- **SOLUTION BASED EDUCATION**. Many students select as their first practicum one of the two problems for which they specified issues and for which they wrote a paper. The "Problems and Issues" paper and the PDP are intended to add clarity and direction to each student's learning expeience. Each student brings to Leadership II, the knowledge gained from the Practicum I problem solving experience. All students will have completed the proposal for Practicum II and several will actually have completed Practicum II.

The New American Schools Development Corporation projects provided new strategies for visions creation. The Community Learning Centers (CLC) project in St. Paul, MN, was of particular interest. The CLC project was presented and four of the 10 focus areas were selected for visions creation to Cluster 38 on December 12, 1992. A modified Myers Briggs test was administered which yields planning preferences: strategic planner, pragmatic manager, strategic humanist, or pragmatic humanist. One group consisted exclusively of strategic humanists, two groups consisted of strategic planners, and a fourth group consisted primarily of pragmatic managers. Assignments were as follows:

1. Strategic Humanists - People Oriented
2. Strategic Planners - World As Campus
3. Strategic Planners - Progressive Curriculum
4. Pragmatic Managers - Extensive Use of Technology

Each group specified aspects of the Design Process, Preliminary Research, and Advanced Research. Reports were presented to the entire cluster.

The "People Oriented" group emphasized the need to commit to equal opportunity through self esteem, cooperative learning, and caring and sharing environments. The "World As Campus" group stressed the need for understanding global issues and multi-culturalism. The "Progressive Curriculum" group emphasized that learning is a personal event and developmental process with a wide array of individual differences expected, accepted and planned for - ability, interest, style, backgrounds, and experiences. The "Use of Technology" group stressed effective and efficient use of a broad range of resources.

The strategy was repeated again with Cluster 40 on April 17, 1993. One group consisted of very strongly committed strategic humanists. A second consisted of

strategic humanists. A third group consisted of very strongly committed strategic planners. A fourth group consisted of strategic planners. A fifth group had two pragmatic humanists and two pragmatic managers. Assignments were as follows:

1. Strategic Humanists - People Oriented
2. " " - Brain Based Learning
3. Strategic Planners - Technology
4. " " - World As Campus
5. Pragmatists - Progressive Curriculum

Each group specified aspects of the Design Process, Preliminary Research, and Advanced Research. Reports were presented to the entire cluster.

The "People Oriented" group emphasized the environment and a success oriented experience with personal conferences and portfolio assessment. The "Brain Based" group stressed holistic right brain/left brain activities. The Technology group emphasized access, coordination and leadership, and participation by all in the learning process. The "World As Campus" stressed being hooked up through interactive video to all types of institutions. The "Progressive Curriculum" group emphasized competencies and skills. Thus, the process of vision creation and co-creation was demonstrated in a close to a "virtual reality" learning experience.

Many of the professionals in Clusters 34, 37, 38, and 40 were "living" their visions and action plans. In the case of the EDUCARE vision and action plan, the "gist" of the idea existed at entry to Leadership I and the entire CYS program contribted significantly to the development of the vision and action plan that has been implemented. In a second case, an idea in science matured to such an extent that the program also provided the impetus for two additional proposals for $1/2 million in "Science, Technology, and Society" in the four months after completion of Leadership II, March through June 1993.

The multi-tech format consists of approximately two-thirds didactic instruction and one-third of the instruction is delivered through other technologies such as audiotapes, videotapes, and computer-based distance learning via electronic classroom, e-mail, bulletin board, notes, talk, etc. All students have access to electronic library and Internet which provides a link to hundreds of special groups such as The Working Group on Teaching and Learning of the Coalition for Networked Information (see Attachment 33).

Personal data variables and change in scores on tests have yielded numerous insights about transformational leadership skills -- conceptual, interactive, and technical (see Appendix E).

THE WORKING GROUP ON TEACHING AND LEARNING
of the
COALITION FOR NETWORKED INFORMATION

The Working Group on Teaching and Learning of the Coalition for Networked Information issued a call for papers that use networking and networked resources to support teaching and learning. The group is particularly interested in projects that take advantage of national networks, use library resources, involve collaboration among different types of institutions and agencies, and are long-term programs easily adaptable for other schools. Projects submitted become part of a database. Two winners were invited to present at EDUCOM '93.

The Coalition of Networked Information is a joint project of the Association of Research Libraries, CAUSE, and EDUCOM, organized in 1990 to promote the development of networked information resources to enrich scholarship and embrace intellectual productivity.

Fifteen proposals were submitted to the call for papers in 1992. Thirty-five proposals were submitted in 1993. You can access the proposals as follows:

```
mmunix
i      Internet Menu
2.     Internet Tools
3.     Gopher
8.     Other Gopher and Information Servers
1.     All Gopher Servers in the World
12*.   Coalition for Networked Information
         (The number of groups is increasing.
         The number was 143 on December 4, 1993)
4.     Coalition Working Groups
7.     Teaching and Learning Groups
2.     Teaching and Learning WG (Gopher Link)
4.     1993 Proposals (Text)/
```

The two winners were:

14. Kids as Global Scientists by Nancy Butler Songer and
23. Peirce Telecommunity Project by Joseph Ransdell.

Check out "Toward the 21st Century" (33).

Partial Technological Delivery System

The multi-tech format provides a unique opportunity for qualitatively superior visions and action plans. Resources that were available only in hard copy just a few years ago are rapidly becoming available in electronic format. This will continue to accelerate due to the implementation of the High-Performance Computing Act of 1991, Public Law 102-194, and strategies such as **USE IT** (United States Education and Instruction through Telecommunications).

Visions created electronically can be transmitted instantaneously and simultaneously almost anywhere in the world. Strategic humanists who may be quite articulate in creating the statement of **beliefs and values** for a vision can obtain help from strategic planners on **technology**, from pragmatic humanists on **specific care provider strategies and techniques**, and from pragmatic managers on **administrative and budget** details. Furthermore, a student is less constrained by geographic, physical, or temporal limitations. Nor is a student limited to peer expertise within the cluster. Students who worked on-line in Clusters 34, 37, 38, 39, and 40 could transmit their work to students in the program in regular or multi-tech format clusters. While students in Cluster 46 begin the process of analysis and vision and action plan creation, students in other clusters can learn from the experience.

The same level of High Performance Learner and Leader can be achieved and even surpassed through a variety of multi-tech strategies. During the late 1970s and early 1980s, several colleges developed **fully articulated** 2+2 programs with area high schools and even had a few 2+2+2 articulated programs with universities. Several colleges and schools improved **synchronization** of student learning outcomes competencies with workforce and workplace needs through strategic planning. This required a major commitment of resources. Today, this can be accomplished electronically. An on-line format can accomplish **vertical articulation** between the layers of the bureaucratic levels, **horizontal integration** between academic and technical units, and the **synchronization with workforce and workplace needs**. Furthermore, the electronic format makes it possible to access ADVOCNET, SpecialNET, and other relevant resources from throughout many parts of the world.

Cluster 57 was the first group that was started in a regular format which parallels a cluster taking CYS in a multi-tech format. Judith Frier, math teacher in the Greenwich (CN) Public Schools, chose "Implementing the New Mathematics Standards Nationally" and "Utilizing Cooperative Learning Strategies to Support the Standards" as two problems and issues which she will pursue throughout CYS. Viola Stallings, Senior Systems Engineer for EduQUEST - An

IBM Education Systems Company in Mt. Laurel (NJ), chose "Using Technology in Mathematics and Science" and "Using Technology in the Classroom" as two problems and issues which she will pursue through CYS. In Cluster 59, Fabio Zuluaga, a science - Spanish resource teacher at Central Middle Magnet School in Kansas City, MO, chose "Immersion Education" in science for middle school youngsters and "Computers in Immersion Classes" as the problems and issues which he will pursue through CYS. Although students live in several countries (Canada, Israel, Puerto Rico, Virgin Islands) and most states, they are collaborating on-line and transmitting information electronically.

Each new cluster is the beneficiary of lessons learned from feedback by professionals. The "parallel processing" of Cluster 57 in a traditional format and Cluster 59 in a multi-tech format yielded many insights. Introducing students to the power of collaborating yields qualitatively superior output. Students in Leadership I in Cluster 62 have already collaborated electronically with students in advanced traditional and multi-tech clusters. An on-line student in any of the more advanced clusters can share information and insights with students in newer clusters including papers and practicums. On-line students can explore Archy, Gopher, and Veronica.

Laudable as the current format and system is, it represents 1980s know-how and technology. Increments of development will be discussed for each of these two topics. Almost all components of Leadership I can be on-line from the instructor's initial letter, course outline and syllabus and diagnostic tests. The Personal Data Variables and diagnostic tests could be processed electronically before the first meeting or during the first meeting to demonstrate the system. Reports of Leadership I and II are available through ERIC but the current process takes about one year. In contrast, reports in the system will be made available in a relatively short period of time.

From a technological perspective, business is already using desktop videoconferencing and beginning to use the voice activated models. Although this technology is in the early stages of development, it holds great potential for enhancing learning and overcoming technophobia problems. Students could have an ecr and break into small group sessions in which each participant could see a small video of others in windows on each side of the screen.

From An Individual Student To Learning Communities

CYS has produced many High Performance Learners and Leaders. The many student projects in this document have merit when considered as "free standing." However, the projects hold the potential of a synergistic impact when viewed from a collaborative learning perspective. Imagine the potential of three or four professionals from each elementary school in a district working with health and social service professionals on each of the "Ready to Learn" objectives (a) preschool programs, (b) child's first teacher, and (c) nutrition and health care. Parallel traditional and multi-tech clusters could be dedicated site-specific for a school district and build upon the strategic goals of that community and district. If a community or district does not have a strategic plan, one could be created prior to the start-up of the cluster or developed as an activity parallel to the programs.

Furthermore, imagine the potential of a group of 30 or 50 professionals collaborating within a school district on math, science, and technology in the middle school years. Professionals in parallel traditional and multi-tech clusters could benefit from insights gained from Judith Freir, Viola Stallings, Fabio Zuluago, and many other "Third Wave" High Performance Learners and Leaders.

Or, imagine the potential of 30 to 50 professionals from community manufacturing and service establishments, schools, and postsecondary colleges collaborating on articulation, integration, and synchronization. A community college or state institution could coordinate a project to create a next generation learning community with a focus on the knowledge producing technologies. Imagine a group working on a project to synthesize the work of the Research and Engineering Council of the Graphic Arts Industries, the Graphic Arts Technical Foundation, and other groups to provide directions relative to literacy and productivity.

The U.S. will need to produce the critical mass of High Performance Learners and Leaders (HPLL) who can develop the knowledge workers of the 21st Century. These HPLL will have to anticipate advances in science and technology and then take a lead role in rethinking how to restructure and revitalize industrial era establishment and to create entirely new human resources development systems.

CYS is producing HPLL with the existing focus on Leadership in areas of specialization. Leadership I is intended to raise the level of awareness and understanding of transformational leadership. Leadership II does provide an excellent capstone experience to a high quality program to achieve commitment and dedication (see Attachment 34).

SESSION OVERVIEW

LEADERSHIP II

SESSION #1	SESSION #2	SESSION #3
Leadership I-II Analysis - Vision Action Plan Myers Briggs	Visions - Oral Presentations in small groups	Mission, Purpose Vision, & Action Plan Oral Presentation
Break	**Break**	
Small Group Discussions Reports	Developing A Multi-Year Plan	Oral Presentations Synthesis of Significant Change
Lunch	**Lunch**	**Lunch**
Visions Alternative Scenarios Small Groups	Students Specify Goals & Methodology For Action Plan	Rethinking Restructuring Revitilizing
Break	**Break**	**Break**
Small Groups The Visions Paper Session #2	The Action Paper The Oral Presentation Session #3	Developmental Tasks Transformational Community

TRANSFORMATIONAL LEADERSHIP

LEADERSHIP I

LEADERSHIP II

AWARENESS & UNDERSTANDING

COMMITMENT & DEDICATION

Programs for Higher Education

The Programs for Higher Education (PHE) developed field based program specializations in higher education: adult education: and vocational, technical, and occupational education (VTOE). The VTOE specialization is available to secondary educators in vocational and technical education. Each student completes six core seminars, two specialization seminars, four practicums, two week long Summer Institutes, a comprehensive examination and a Major Applied Research Project (MARP). The program is offered in numerous sites around the country including Philadelphia. The Philadelphia Cluster meets at Buck County Community College.

Since 1984, the specialization seminars have been taken with the Summer Institute. The VTO specializations have completed several cycles of Personnel - Human Resources Development and Emergence of VTOE. The 1984-85 cycle had a focus on Agents of Change, 1986-87 on Transformational Leaders, 1988-89 on Strategic Thinkers, and 1990-91 on Restructuring Establishments. P-HRD was moved into the core seminar sequence as Human Resources Development after 1990 and Trends and Issues added. EVTO 1992 focused on Building Learning Communities. A comprehensive report is available in ED 351 499.

Two of the core seminars are Governance and Management and Human Resources Development. An institution s strategic planning process should yield strategic directions and a plan with organizational development and human resources development components which are in synchronization. Nine students from Mercer County Community College (NJ) enrolled in PHE worked with the Executive Council to develop a strategic planning process which yielded a framework.

Several of the projects mentioned in this document were by students in PHE including the Full Service Community Family Center for Training Purposes, social work use of technology, needs assessment, program review and alternative education in Taiwan. Yng-Chien Sheu is currently developing a strategic plan for a Printing Technology Department at National Taiwan Normal University, the only such department in Taiwan and which could be linked to other countries.

PHE began to offer a specialization in Computing and Information Technology (CIT) in 1993. CIT students complete all of the above-mentioned requirments and do some of the work on-line. Imagine the potential of professionals from middle, secondary, and joint vocational-technical schools in collaboration with colleges and universities all working on projects in graphic communications in either CYS or PHE. An on-line **Super School in Graphic Communications** is within reach and could be the basis of a strategic alliance with Pacific Rim countries.

BEST COPY AVAILABLE

CONCLUSIONS

The world is undergoing fundamental restrucutring. The European Community, the Pacific Rim countries, and the North American Free Trade Agreement countries are adjusting their economies in order to be the dominant region in the new world order. The nations, regions, and states that will be the beneficiaries of the structural change will be the ones that adjust and restructure **systems** and **human resources development infrastructure to produce knowledge workers** for the new information era.

The United States was preeminent in the 1940s and 1950s. The U.S. generated 75% of the Gross World Product, produced 50% of the machine tools, had a per capita income twice that of the next closest nation, and enjoyed the highest national standard of living. Today, the U.S. generates 20% of the GWP, produces 10% of the machine tools, ranks 9th in per capita income, and the quality of life for many people has fallen significantly. Infant mortality in the U.S. is below that of several underdeveloped nations.

The U.S. was preeminent primarily because of its mindset about **creativity** and **inventiveness** relative to industrial era principles and their application to other institutions, particularly establishments in the social infrastructure such as education and training and health and human services. The U.S. created a research and development infrastructure and a mass public education system to provide the critical mass of intellectual capital and the workforce for the workplaces of the industrial era.

When U.S. preeminence was challenged through the launching of the Sputniks in 1957, President John F. Kennedy announced a **systems** and **human** resources development program to focus research and development on science and technology to compete in space race and possibly wage a hot war. When the announcment was made, the U.S. had not invented or discovered all the knowledge necessary to "push" the nation into the modernization era of the 1970s and 1980s. President Lyndon B. Johnson added a great society program and started education reform. A few institutions led the way and altered the course of education reform by committing themselves to inventing systems in which doctoral candidates demonstrated and documented the application of new knowledge as a legitimate form of "academic" pursuit.

The **restructuring** challenges of the 1990s are far more complex than the **expansion** of the 1950s and 1960s or the **modernization** of the 1970s and 1980s. The winner of the high skill and high growth economy will be beneficiary of high quality of life. The challenges are greater than converting a workforce familiar with radio technology to cellular technology or landing a man on the moon and

returning him safely to earth. The challenges of the 1990s space race are to improve (a) the **synapses** of the mind about fundamental restructuring and (b) the **connectiveness** of **intelligence** through networked systems. The conversion will require a "future pull" of mind and will, coupled with scientific know-how and technology. The manufacturing and service sectors of the economy will restructure at an increasing rate in the 1990s. The areas that want to be the beneficiaries of the new economic order will create a future pull toward Learning Communities of the 21st Century and restructure social infrastructure establishments to produce knowledge workers for that global information era based on **anticipation, innovation, and excellence.**

Samuel Gould (1970) defined communiversity as "A loose federation of all educational and cultural resources which exist to serve the citizens, society and economy in a community or well defined region." James MacGregor Burns (1978) drew the distinction between transactional and transformational leadership. Transactional leadership occurs when individuals make contact for the purpose of the exchange of something. Transformational leadership involves mutual stimulation and elevation of attitudes, beliefs, and values. A university is intended to assist the society of which it is a part through the development of (a) new knowledge and its application to solution of societal problems of broad public interest and (b) a workforce to help shape and function well in the emerging era.

The U.S. needs establishments committed to inventing Learning Communities, a federation with a Communiversity or Globalversity at the core. It could accept a challenge such as "To design and perfect a human resources development system to produce knowledge workers of the 21st Century who have zero defects." While not all the knowledge is available to invent such a system, the words have a "future pull" magnetism to them that suggests that a community of scholars with expertise in theory, research, and applications should be able to create bold, visionary models with increased excellence, somewhat akin to The Edison Project and the New American Schools Development Corporation Project. Globalversities would commitment themselves to impacting on the problems like famine and AIDS of the have not nations. These establishments become committed to achieving the Malcolm Baldrige National Qaulity Achievement in Education for Service & Technology Transfer.

* * * * * * * * * *

Problems cannot be solved at the same
level of consciousness that created them.

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APPENDIXES

A. Information on Effective Establishments

B. Visions

C. Graphic Arts Technical Foundation Certification

D. Child and Youth Studies

E. Empowering People for Creating Learning Communities

* * * * * * * * * *

A "Third Wave" Electronic College

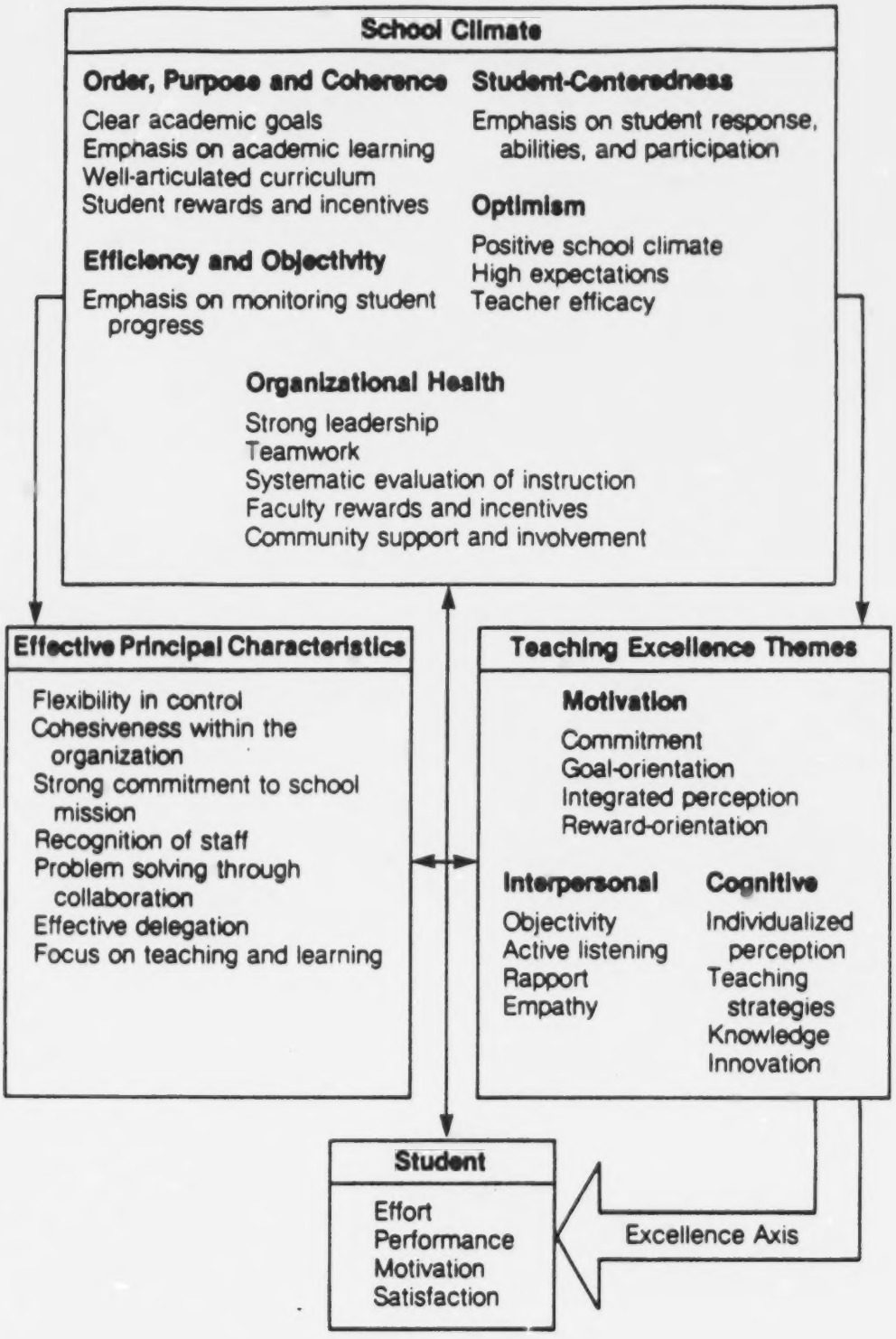
Judith W. Leslie uses Toffler's The Third Wave to develop an educational institution in an advanced technical era dominated primarily by electronic media.

> This methodology would allow the learner to proceed at his/her own rate and style, within his/her own time period, at his/her desired location, drawing upon learning materials from throughout the country and the world. Computer science and electronics courses and programs of study would be an integral part of the curriculum. Faculty would be cross-trained in a variety of disciplines and teaching styles. They would have flexible work schedules and loads and might share an assignment with a spouse or colleague. Many faculty would instruct from their home or electronic cottage....
>
> Judith W. Leslie. "As The Third Wave Approaches Higher Education: Planning For the Electronic Institution." CAUSE/EFFECT. January 1981, Vol. 4, No. 1, p. 15.

Appendix A

Information on Effective Establishments

FIGURE 1.
Roueche-Baker Integrated Model of Excellent Schools.



The mission of the Upper Dublin School District
is to provide the environment and
opportunities which enable all students
to acquire the basic knowledge,
learning skills and social skills necessary
to grow throughout their lives and
to become responsible members of
a dynamic society.

The mission of the Montgomery County
Intermediate Unit is to efficiently provide
and coordinate services which meet the diverse
educational needs of children in Montgomery County.
These services are designed to enable each
student to find lifelong personal fulfillment
as a member of society.

Gwinnett County Public Schools

INITIAL ELEMENTS OF STRATEGIC PLAN

BELIEFS

We believe that all people have inherent, immeasurable worth.

We believe that all people have unlimited potential.

We believe that all people have the right to learn anything.

We believe that all people can learn anything they choose to learn.

We believe that all people have choices and are responsible for the consequences of their choices.

We believe that all people have the right to a safe, healthy environment.

We believe that all people have the right, need and ability to experience success.

We believe that all people have a need for self-worth derived from a feeling of belonging and productivity.

We believe that the greater the self-worth, the greater the personal growth.

We believe that high achievement is the result of the diligent pursuit of high expectations.

We believe that all people are dependent on one another.

We believe that all individuals have the moral obligation to self and society to develop and use their talents to the fullest.

We believe that an individual's uniqueness is his greatest asset to self and others.

We believe that people are more important than things and processes.

We believe that the good of the group can never violate the rights of the individual, but the good of the group takes precedence over personal privilege.

We believe that integrity is the most important aspect of character.

We believe that learning is a life-long process.

We believe that the first priority of any society is to educate its people.

MISSION STATEMENT

The mission of the Gwinnett County Public Schools, as the leading partner in a total community education partnership, is to guarantee individual student success in creating and exercising life choices through performance-based personalized learning experiences; educational experiences of choice; full utilization of technology; mutual accountability of parents, educators and learners; and by fully integrating all the many resources of our richly diverse community.

OBJECTIVES

To have 100 percent of our students achieving at their optimum.

To have 100 percent of Gwinnett County Public Schools' students make successful transitions into the post-secondary endeavors of their choice.

BEST COPY AVAILABLE

STRATEGIC POLICIES

(Draft Versions)

We will practice participative management at every level of the organization.

We will not tolerate prejudicial discrimination on the part of anyone.

Nothing will take precedence over the primary through secondary instructional program.

We will not accept failure.

All decisions will be made based strictly on the best interest of the student.

No student will advance without mastery of basic skills and knowledge.

STRATEGIES

I. We will redefine and guarantee student achievement to include an emphasis on individual potential, special needs and criteria for advancement.

II. We will employ, retain and reward superior staff.

III. We will create learning environments that ensure student achievement and well–being.

IV. We will develop and implement an effective communication and information network, internally and externally.

V. We will aggressively pursue and obtain additional and alternative public and private funding.

VI. We will guarantee the validity of all programs to ensure that the allocation of all resources is justified by return on investment.

VII. We will aggressively develop community partnerships to accomplish our mission and objectives and define our role in these partnerships.

VIII. We will incorporate innovative technology into all aspects of our instructional and support programs.

IX. We will redesign the curriculum, its development and its implementation, to achieve personalized learning.

X. We will capitalize on and meet the needs of our rich, culturally diverse community.

XI. We will develop a long–term facilities plan.

XII. We will develop and implement an exemplary staff development program to support the mission.

XIII. We will develop performance standards and personal accountabilities for all staff.

XIV. We will organize strategically.

DIMENSIONS OF ORGANIZATIONAL HEALTH

OPEN COMMUNICATIONS

EMPLOYEE INVOLVEMENT

LEARNING AND RENEWAL

VALUED DIVERSITY

INSTITUTIONAL FAIRNESS

EQUITABLE REWARDS AND RECOGNITION

COMMON ECONOMIC SECURITY

PEOPLE-CENTERED TECHNOLOGY

HEALTH-ENHANCING WORK ENVIRONMENTS

MEANINGFUL WORK

FAMILY/WORK/LIFE BALANCE

COMMUNITY RESPONSIBILITY

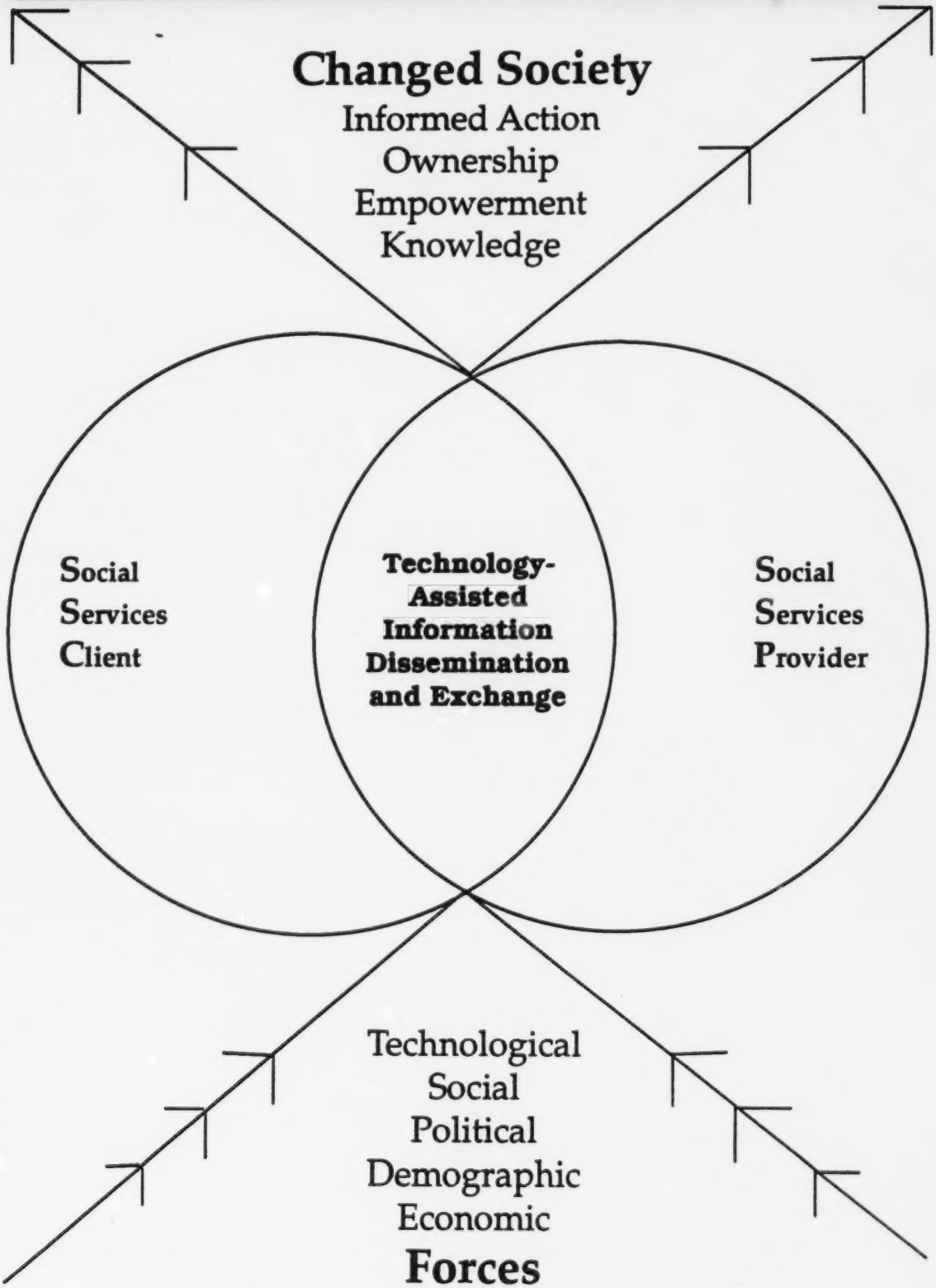
ENVIRONMENTAL PROTECTION

Healthy Companies, 1420 16th St., N.W., Washington, D.C. 20034

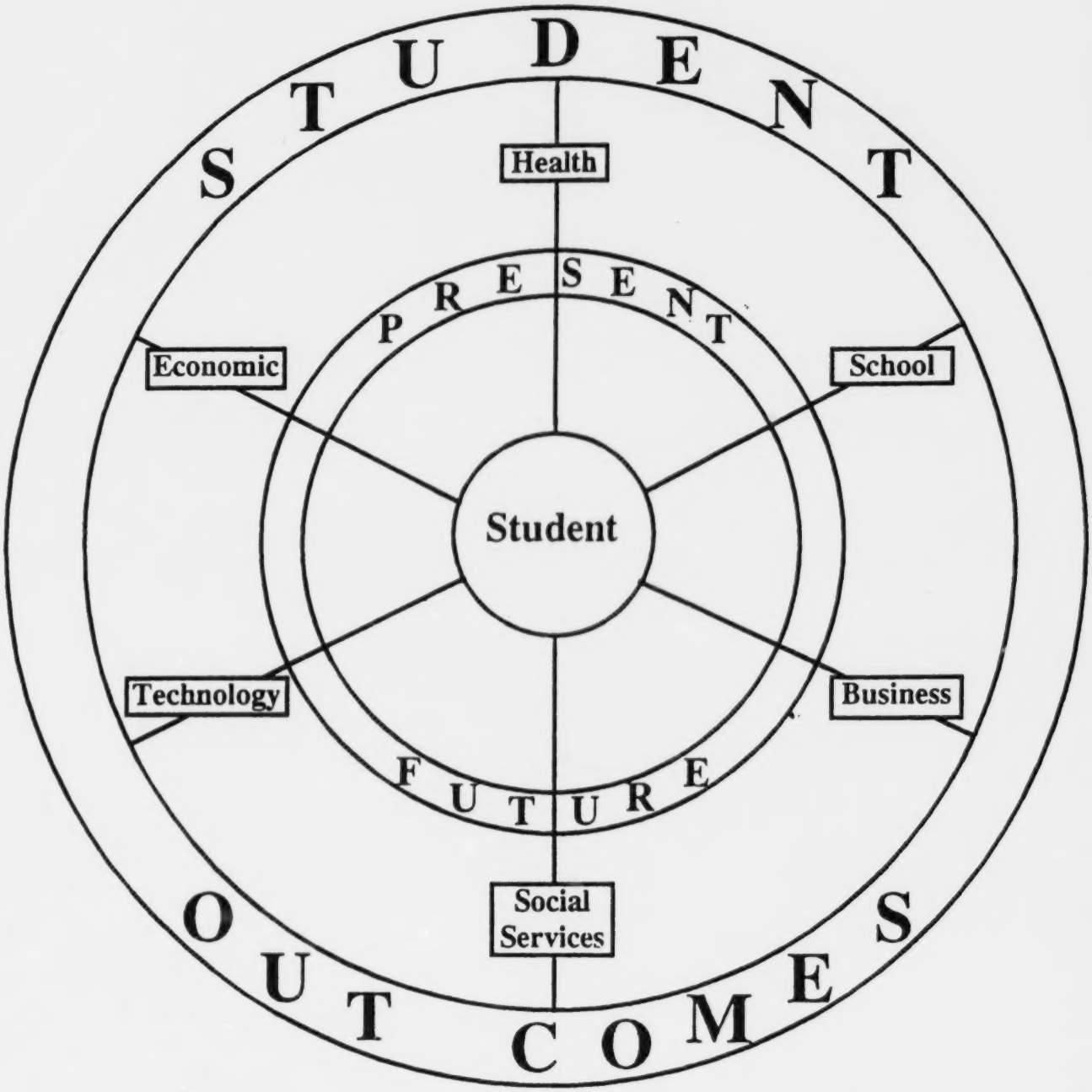
Appendix B

Visions

A Vision for Social Services Where Information Empowers



Child-Centered Full-Service School



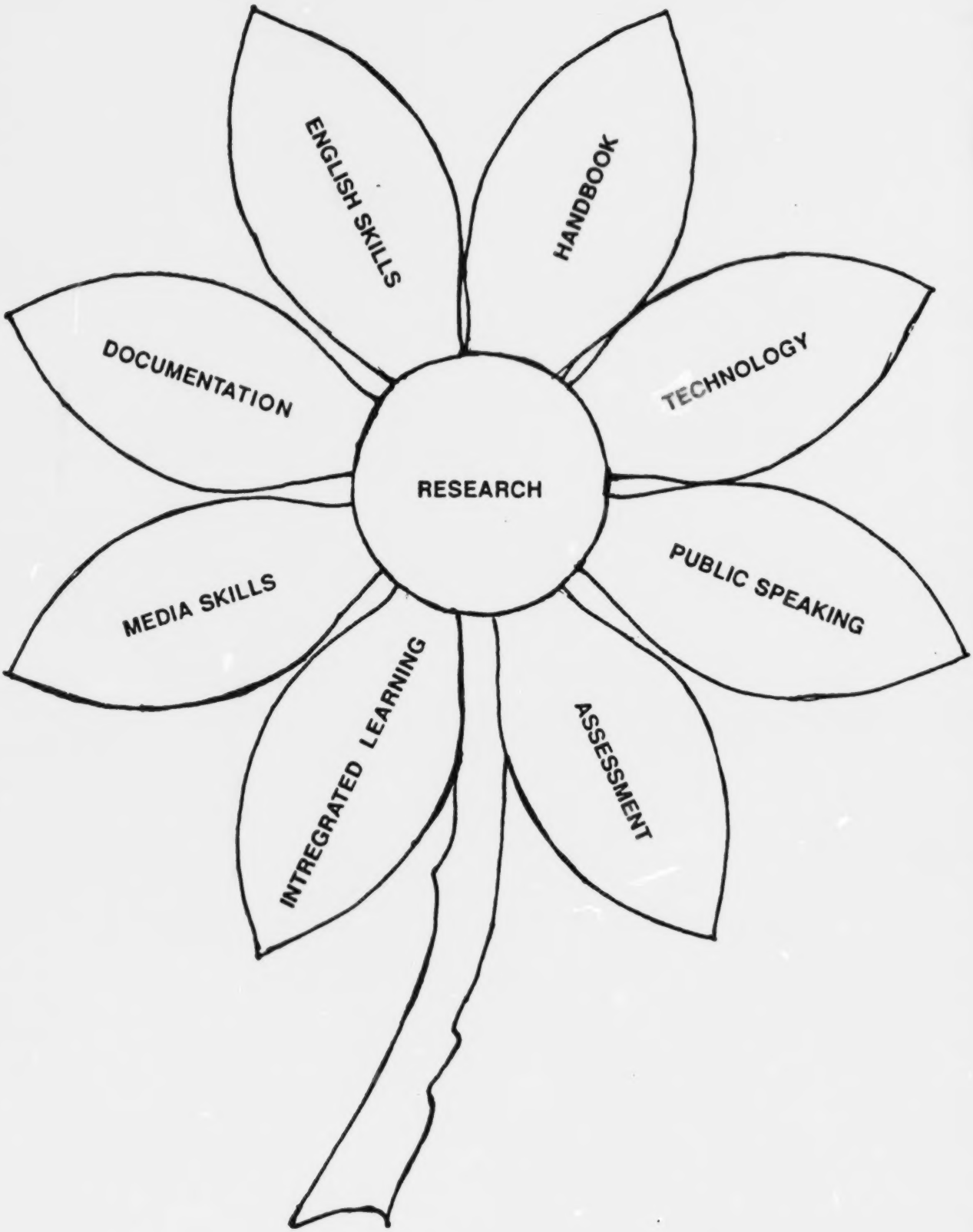


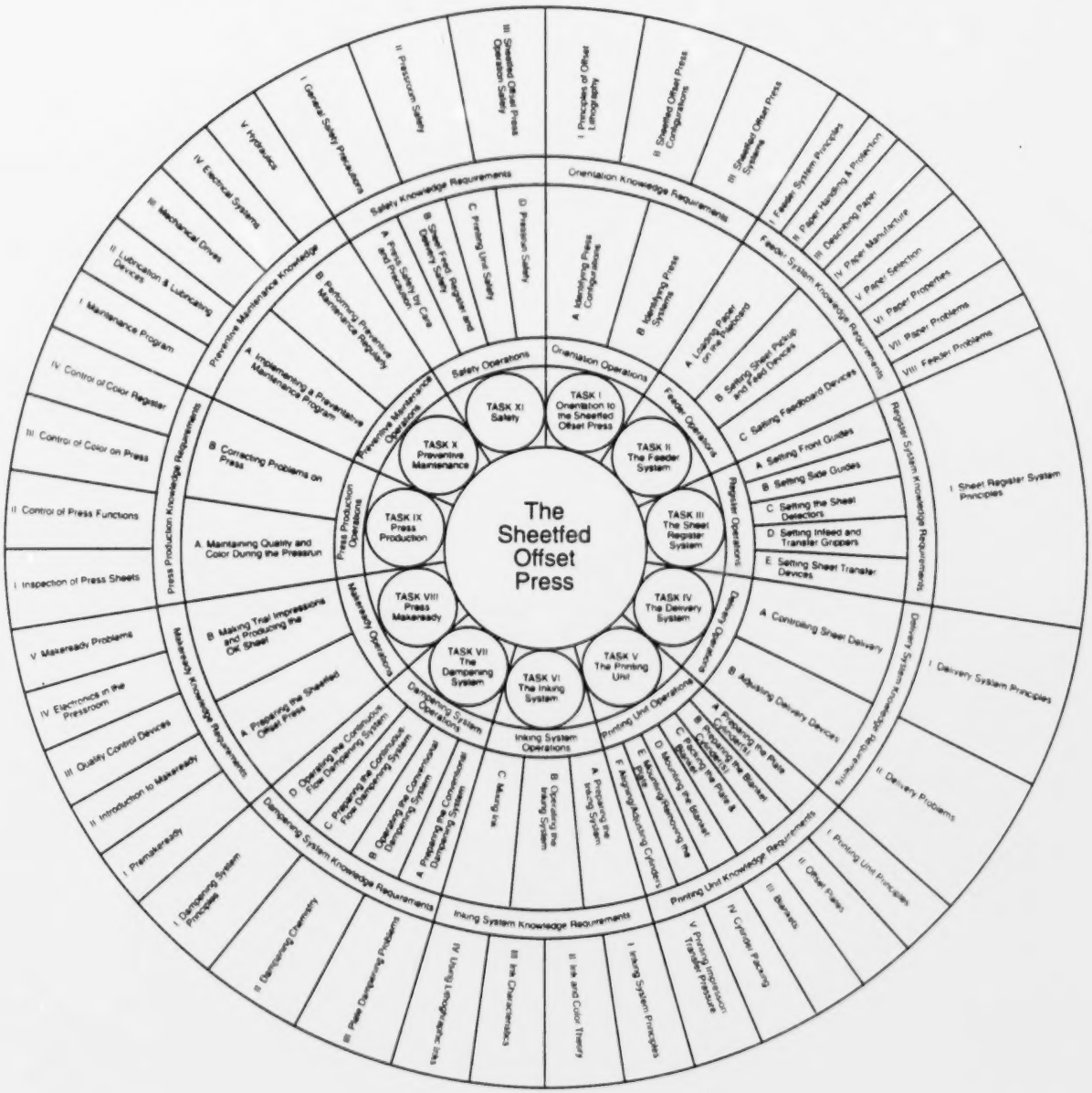
Figure 1. The Research Flower: Petals of Potential

Appendix C

Graphic Arts Technical Foundation Certification

Sheetfed Offset Press

The wheel is a graphic representation of Knowledge areas (outer circle), and Operations (inner circle).


The Sheetfed Offset Press
TASK I Orientation to the Sheetfed Offset Press
TASK II The Feeder System
TASK III The Sheet Register System
TASK IV The Delivery System
TASK V The Printing Unit
TASK VI The Inking System
TASK VII The Dampening System
TASK VIII Press Makeready
TASK IX Press Production
TASK X Preventive Maintenance
TASK XI Safety
Orientation Operations
Feeder Operations
Register Operations
Delivery Operations
Printing Unit Operations
Inking System Operations
Dampening System Operations
Makeready Operations
Press Production Operations
Preventive Maintenance Operations
Safety Operations
Orientation Knowledge Requirements
Feeder System Knowledge Requirements
Register System Knowledge Requirements
Delivery System Knowledge Requirements
Printing Unit Knowledge Requirements
Inking System Knowledge Requirements
Dampening System Knowledge Requirements
Makeready Knowledge Requirements
Press Production Knowledge Requirements
Preventive Maintenance Knowledge
Safety Knowledge Requirements
I Printing Applications
II Sheetfed Offset Press Configurations
III Sheetfed Offset Press Systems
I Feeder System Principles
II Paper Handling & Protection
III Describing Paper
IV Paper Manufacture
V Paper Selection
VI Paper Properties
VII Paper Problems
VIII Feeder Problems
I Sheet Register System Principles
I Delivery System Principles
II Delivery Problems
I Printing Unit Principles
II Offset Plates
III Blankets
IV Cylinder Packing
V Printing Impression Transfer Pressure
I Inking System Principles
II Ink and Color Theory
III Ink Characteristics
IV Using Lithographic Inks
III Plate Dampening Problems
II Dampening Chemistry
I Dampening System Principles
I Prepress Safety Precautions
II Pressroom Safety
III Sheetfed Offset Press Operation Safety
A Press Safety for Crew and Preventive Safety
B Sheet Feed, Register and Delivery Safety
C Printing Unit Safety
D Pressroom Safety
A Identifying Press Configurations
B Identifying Press Systems
A Loading Paper on the Feedboard
B Setting Sheet Pickup and Feed Devices
C Setting Feedboard Devices
A Setting Front Guides
B Setting Side Guides
C Setting the Sheet Detectors
D Setting Infeed and Transfer Grippers
E Setting Sheet Transfer Devices
A Controlling Sheet Delivery
B Adjusting Delivery Devices
A Preparing the Plate (Conventional)
B Preparing the Blanket (Conventional)
C Preparing the Plate & Blanket (Waterless)
D Mounting the Blanket
E Mounting/Removing the Plate
F Applying/Adjusting Cylinders
A Preparing the Inking System
B Operating the Inking System
C Managing Ink
A Preparing the Conventional Dampening System
B Operating the Conventional Dampening System
C Preparing the Continuous Flow Dampening System
D Operating the Continuous Flow Dampening System
A Preparing the Sheetfed Offset Press
B Making Trial Impressions and Producing the OK Sheet
A Maintaining Quality and Color During the Pressrun
B Correcting Problems on Press
A Implementing a Preventative Maintenance Program
B Performing Preventive Maintenance Regularly
I Maintenance Program
II Lubrication & Lubricating Devices
III Mechanical Drives
IV Electrical Systems
V Hydraulics
IV Control of Color Register
III Control of Color on Press
II Control of Press Functions
I Inspection of Press Sheets
V Makeready Problems
IV Electronics in the Pressroom
III Quality Control Devices
II Introduction to Makeready
I Premakeready

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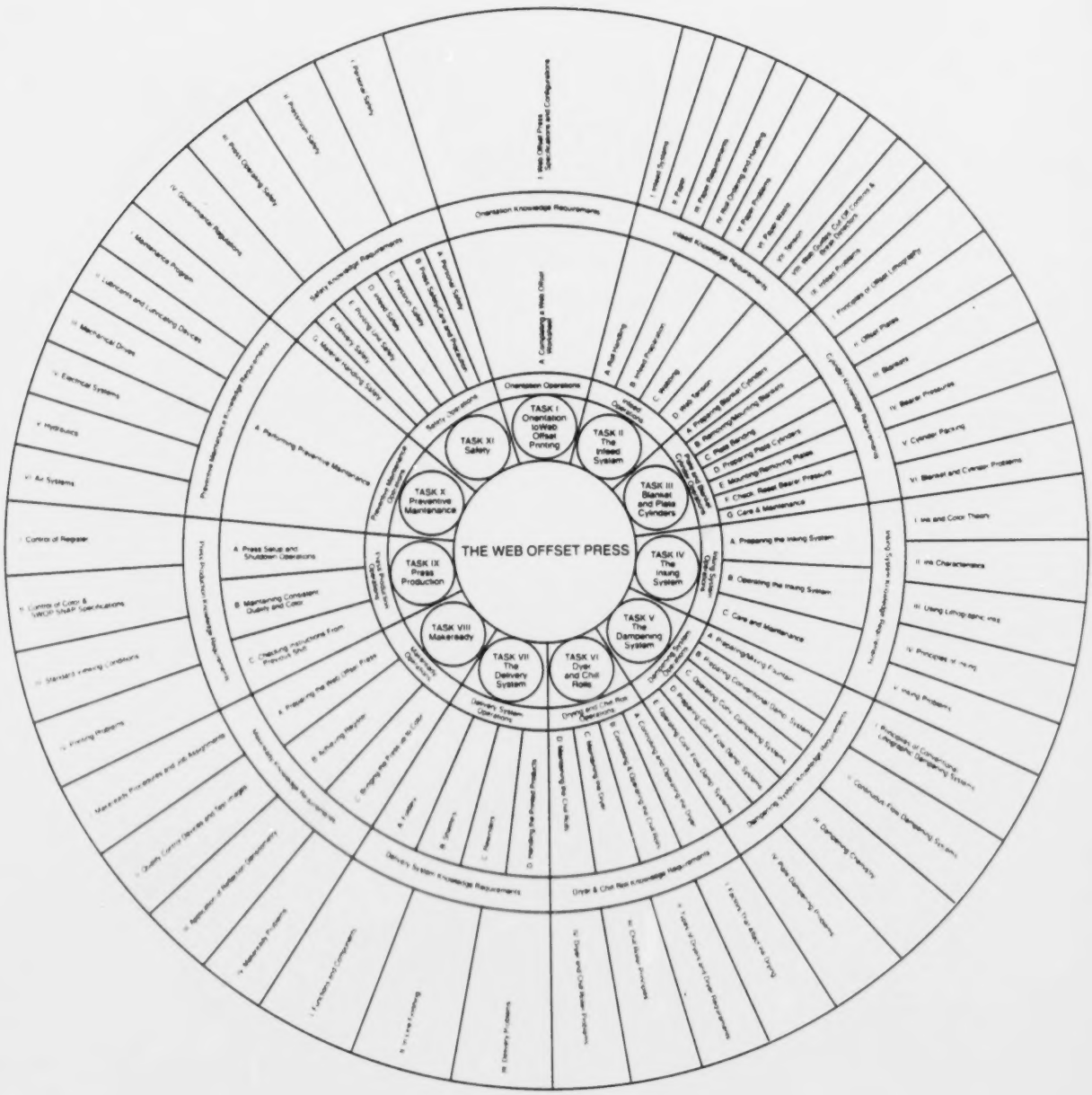
Web Offset Press

The wheel is a graphic representation of Knowledge areas (outer circle), and Operations (inner circle).


THE WEB OFFSET PRESS
TASK I Orientation to Web Offset Printing
TASK II The Infeed System
TASK III Blanket and Plate Cylinders
TASK IV The Inking System
TASK V The Dampening System
TASK VI Dyer and Chill Rolls
TASK VII The Delivery System
TASK VIII Makeready
TASK IX Press Production
TASK X Preventive Maintenance
TASK XI Safety

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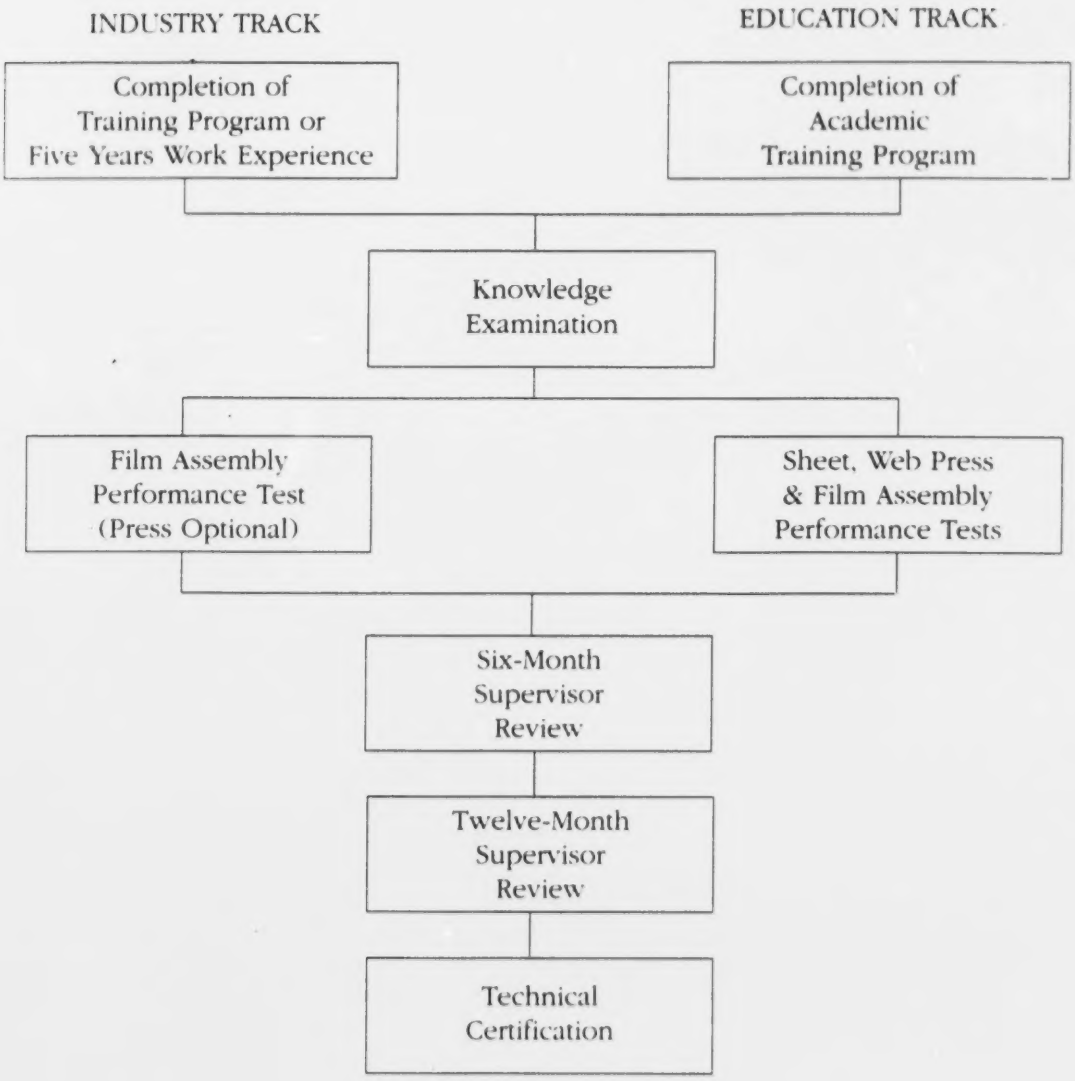
TRACKS TO GATF TECHNICAL CERTIFICATION


INDUSTRY TRACK
EDUCATION TRACK
Completion of Training Program or Five Years Work Experience
Completion of Academic Training Program
Knowledge Examination
Film Assembly Performance Test (Press Optional)
Sheet, Web Press & Film Assembly Performance Tests
Six-Month Supervisor Review
Twelve-Month Supervisor Review
Technical Certification

Appendix D

Child and Youth Studies

CLUSTER 62 - NATIONAL V

Coordinator: Dr. Lois Ann Hesser

	Year 1		Year 2		Year 3	
Mth	Date	Content	Date	Content	Date	Content
Oct	10/7 - 8/93 10/8 - 9/93 10/10 - 11/93	Orientation/Registration Intro to Telecommunications Leadership I	10/7 - 8/94 10/9 - 10/94	Developmental Issues Technology I (Not required for APTEC *)	10/6 - 7/95 10/8 - 9/95	Research & Evaluation II Technology II (Not required for APTEC *)
Nov	ecr/email	Leadership I	ecr/email	Developmental Issues	Audiobridge	Research & Evaluation II
Dec	ecr/email	Leadership I	ecr/email	Developmental Issues End of Tech I: 1/1	ecr/email	Research & Evaluation II End of Tech II: 12/30
Jan	ecr/email	Leadership I (End of Ldr I: 1/30)	ecr/email	Developmental Issues	ecr/email	End of R&E II: 1/30
Feb	2/17/94 2/18/94 2/19 - 21/94	Telecommunications Practicum I Orientation Research & Evaluation I (2 1/2 days)	2/17 - 18/95 2/19/95 2/20/95	Developmental Issues Practicum II Orientation Telecommunications	2/17 - 18/96 2/19/96	Political Process/Social Issues Leadership II
Mar	Audiobridge	Research & Evaluation I	ecr/email	Developmental Issues	ecr/email	Political Process/Social Issues
Apr	ecr/email	Research & Evaluation I	4/95	End of Dev I: 4/1	ecr/email	Political Process/Social Issues
May	ecr/email	Research & Evaluation I Begin Specialization I	5/95	Begin Specialization II	ecr/email	Political Process/Social Issues End of PPSI: 6/1
Jun		End of R&E I: 6/1			ecr/email	Leadership II
Jul	FORT LAUDERDALE, FLORIDA SUMMER INSTITUTE 7/16 - 23/94 (APTEC Technology I) 7/14 - 23/94		FORT LAUDERDALE, FLORIDA SUMMER INSTITUTE 7/ - /95 (tba) (APTEC Technology II) 7/ - /95 (tba)			
Aug	No class session		No class session		No class session	
Sep	9/94	No class session Specialization ends 9/15	9/95	No class session Specialization ends 9/15	9/96	No class session
Oct					10/12 - 13/96	Leadership II End of third year

* APTEC students receive two days of advanced Technology I & II instruction prior to Summer Institute in place of the Technology I & II study areas scheduled for the cluster.

CLUSTER 65 WILMINGTON

Coordinator: Dr. Rosalyn Lenhoff

	Year 1		Year 2		Year 3	
Mth	Date	Content	Date	Content	Date	Content
Dec	12/11/93 12/12/93	Orientation/Registration Leadership I	12/17/94	Research & Evaluation I	12/95	No class session
Jan	1/8/94	Leadership I	1/21/95	Developmental Issues	1/27 - 28/96	Technology II (Not required for APTEC *)
Feb	2/5/94	Leadership I	2/18/95	Developmental Issues	2/96	No class session
Mar	3/5/94	Leadership I	3/18/95	Developmental Issues	3/23/96	Political Process/Social Issues
Apr	4/9/94	Practicum I Orientation	4/22/95	Developmental issues	4/27/96	Political Process/Social Issues
May	5/7 - 8/94	Technology I (Not required of APTEC *) Begin Specialization I	5/14/95	Developmental Issues Begin Specialization II	5/96	No class session
Jun	6/94	No class session	6/17/95	Practicum II Orientation	6/1/96	Political Process/Social Issues
Jul	FORT LAUDERDALE, FLORIDA SUMMER INSTITUTE 7/16 - 23/94 APTEC (Includes Technology I) 7/14 - 23/94		FORT LAUDERDALE, FLORIDA SUMMER INSTITUTE 7/8 - 15/95 APTEC (Includes Technology II) 7/8 - 15/95			
Aug	No class session		No class session		No class session	
Sep	9/17/94	Research & Evaluation I (Specialization ends 9/15)	9/9/95	Research & Evaluation II (Specialization ends 9/15)	9/21/96	Leadership II
Oct	10/15/94	Research & Evaluation I	10/21/95	Research & Evaluation II	10/26/96	Leadership II
Nov	11/19/94	Research & Evaluation I	11/18/95	Research & Evaluation II	11/23/96	Leadership II
Dec					12/96	End of third year

* APTEC students receive two days of advanced Technology I and II prior to Summer Institute in place of the Technology I & II study areas scheduled for the cluster.

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LEADERSHIP I: ASSIGNMENT THREE
PROBLEMS AND ISSUES OUTLINE

Viola P. Stallings, Cluster 57
Child and Youth Studies, Ed.D.

Problem #1, Using Technology in Mathematics and Science

Issue #1, National Impact

a. We have lost the lead in turning technology into products.
b. Within the last 25 years math has been revolutionized, but not in most schools.
c. The world depends on the wisdom gain from science, technology, and math.

Issue #2, Administrators and the School Board

a. Administrators have the challenge of finding math and science (American) teachers.
b. School districts need the help of business.

Issue #3, Teachers

a. Students need to be motivated to major in math and science.
b. Some circumstances and opposition impede progress of the teachers.

Issue #4, Parents

a. Parental expectations directly influence students' accomplishments.
b. Programs have to be in place to involve parents.

Issue #5, Students

a. Educators are competing for the attention of students.
b. Students spend more time watching TV and playing video games than in the classroom.
c. Classes have to be as or more interesting than TV or games.

LEADERSHIP I: ASSIGNMENT THREE
PROBLEMS AND ISSUES OUTLINE

Viola P. Stallings, Cluster 57
Child and Youth Studies, Ed.D.

Problem #2, Using Technology in the Classroom

Issue #1, Students

a. Many students are not technologically prepared for the workforce.
b. Eight hours of computer access is being recommended.
c. Another recommendation is change the curriculum.
d. The third recommendation is to have technology in-service days.

Issue #2, Teachers

a. Teachers have access to one computer in their classrooms.
b. Teachers need to be involved when technology plans are being made.

Issue #3, Classroom

a. Computers in the classroom give the student more access than a lab.
b. Students benefit more from having computers in classroom computers. than just in the lab.

Issue #4, Funding

a. Many schools depend completely on the local budget being passed.
b. Alternate funds are corporate and federal grants.

Issue #5, Facilities

a. Classroom space has become a problem.
b. Extra building funds allow the school district to invest in technology. in the classroom as they expand or build.

Issue #6, Networks

a. Networks can be more expensive initially than standalone computers.
b. During it right the first time, cost less in time, money, and effort.

Issue #7, Curriculum

a. Procedures to implementing technology in the classroom can be challenging.
b. School can take advantage of developed curriculum integration ideas.

Appendix E

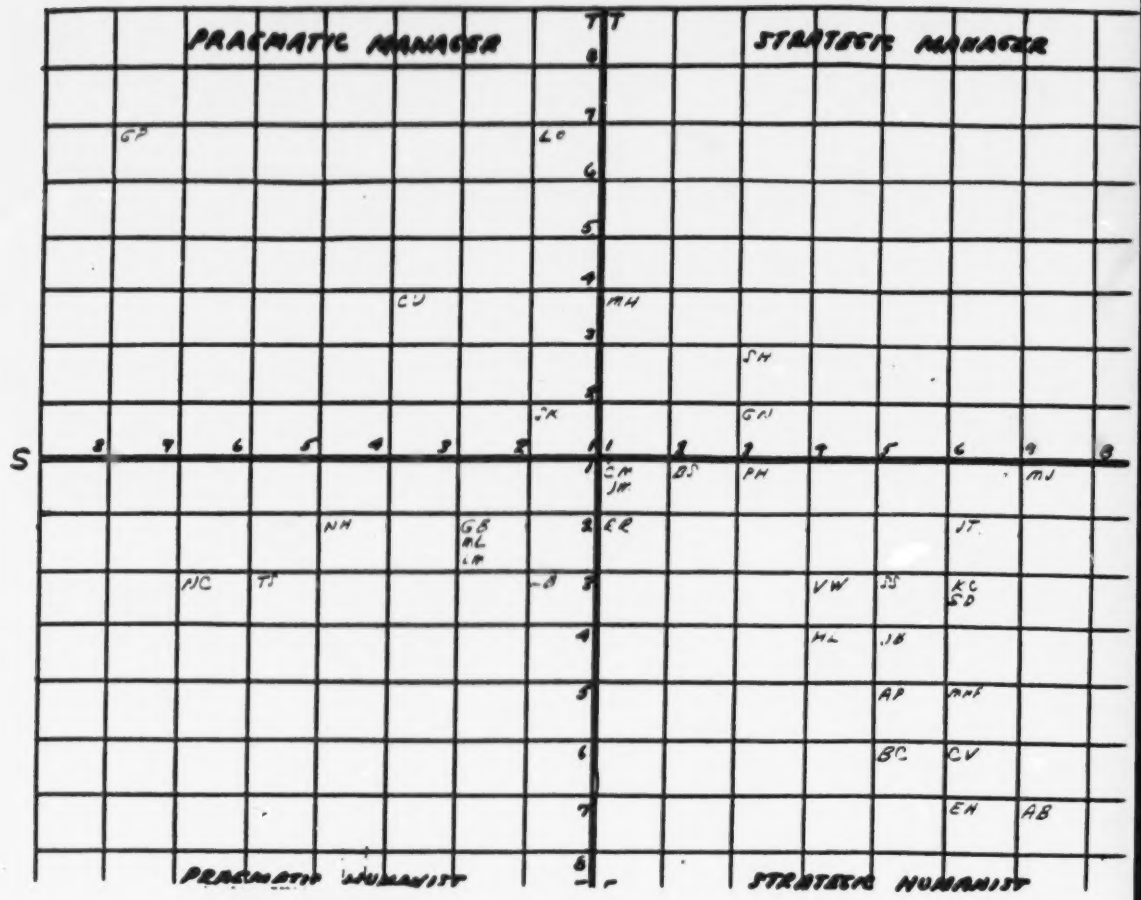
Empowering People for Creating Learning Communities

Each individual is a blend of culture and experiences that has resulted in a mosiac of beliefs, values, and predispositions. Each individual has unique attributes to contribute to vision creation and action plan development. Dr. Gary Gappert, Director of the Futures Center at the University of Akron, has modified the Myers-Briggs Type Indicator (MBTI) to identify planning preferences: Strategic Humanist (SH), Strategic Planner (SP), Pragmatic Humanist (PH) and Pragmatic Manager (PM).

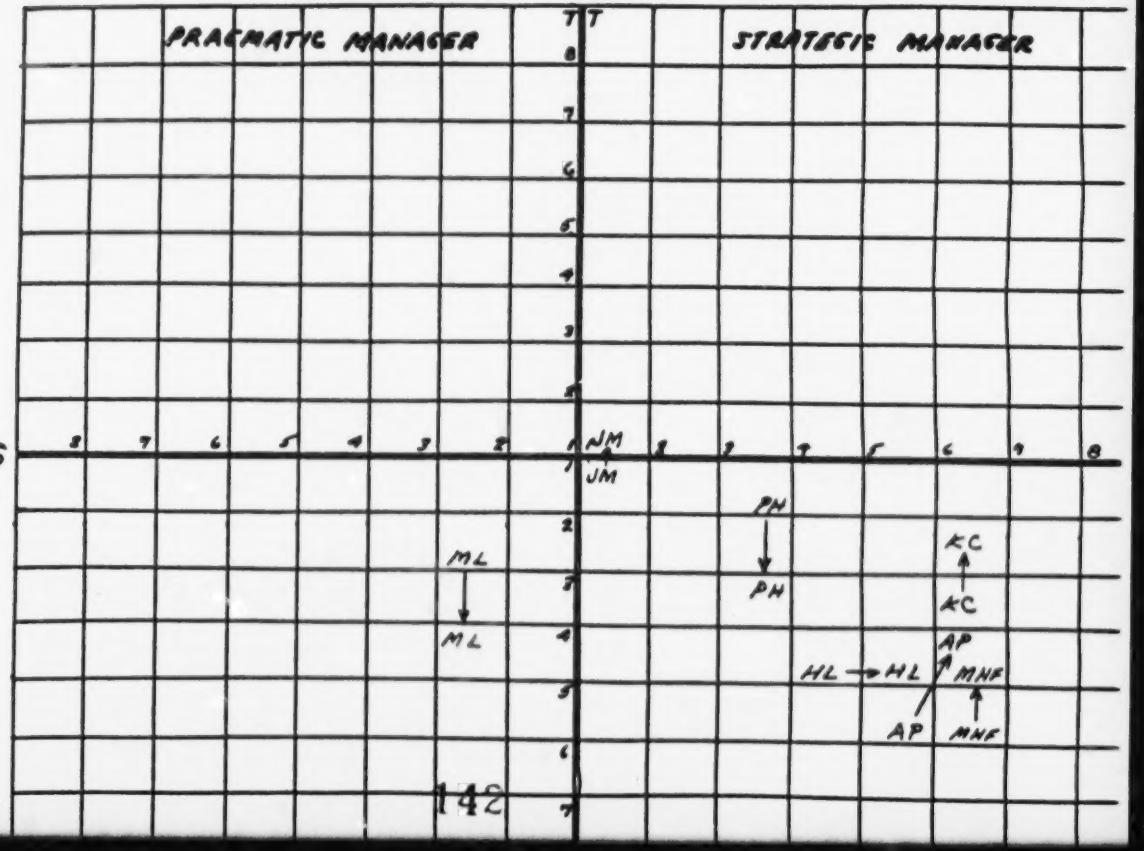
The Gappart planning preferences test had been used quite frequently to group participants to accomplish tasks. The next several pages contain information about change in planning preference of professionals over the three years in the Child and Youth Studies (CYS), planning preferences of professionals who are enrolled in the four CYS multi-tech clusters, and the change in planning preferences of professionals in the first multi-tech cluster.

Visioning and scenario development has evolved over the past several decades. Scenarios and visions were classified as "expansion," "steady state," or "contraction" during the late 1960s and 1970s based on a number of internal and external variables. Scenario classifications that were added during the 1980s were (a) contemporary traditional, (b) partial technological, and (c) technology intensive. Analysis of education restructuring in the 1980s and a workshop on "Alternative Education" for the Arkansas State Department of Education in 1989 led to the following classifications: (a) contemporary traditional education, (b) partial technological/technology intensive education, (c) collaborative lifelong learning, and (d) solution based learning. Solution based learning is the next generation of the competency-based and outcomes-based education movement. The above-named "choices" of alternative education have been matched with planning preferences as follows:
Strategic Humanist - Solution based learning
Strategic Planner - Technology intensive learning
Pragmatic Humanist - Collaborative lifelong learning
Pragmatic Manager - Contemporary traditional education

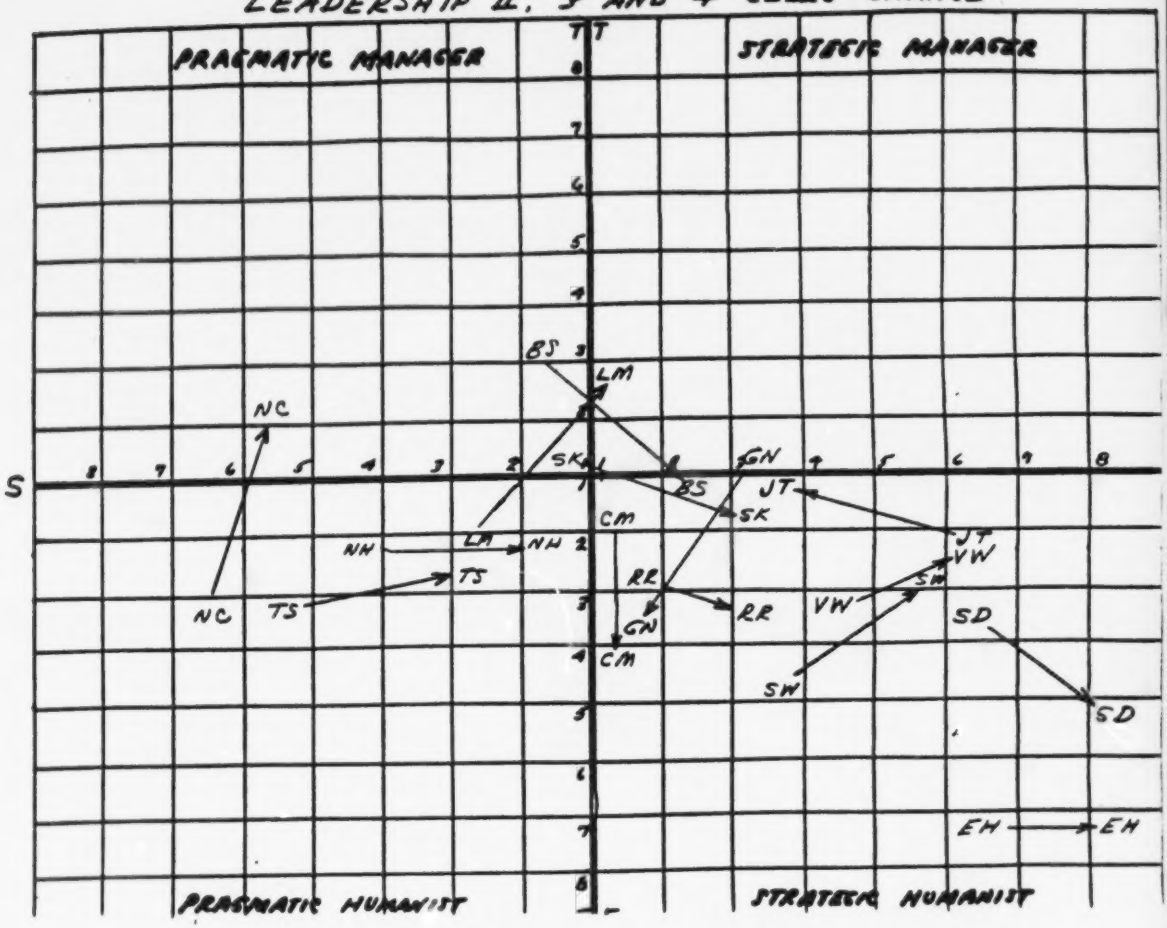
LEADERSHIP I, CLUSTER #37, 1987



LEADERSHIP II, 0 AND UP TO 2 CELLS CHANGE



LEADERSHIP II, 3 AND 4 CELLS CHANGE



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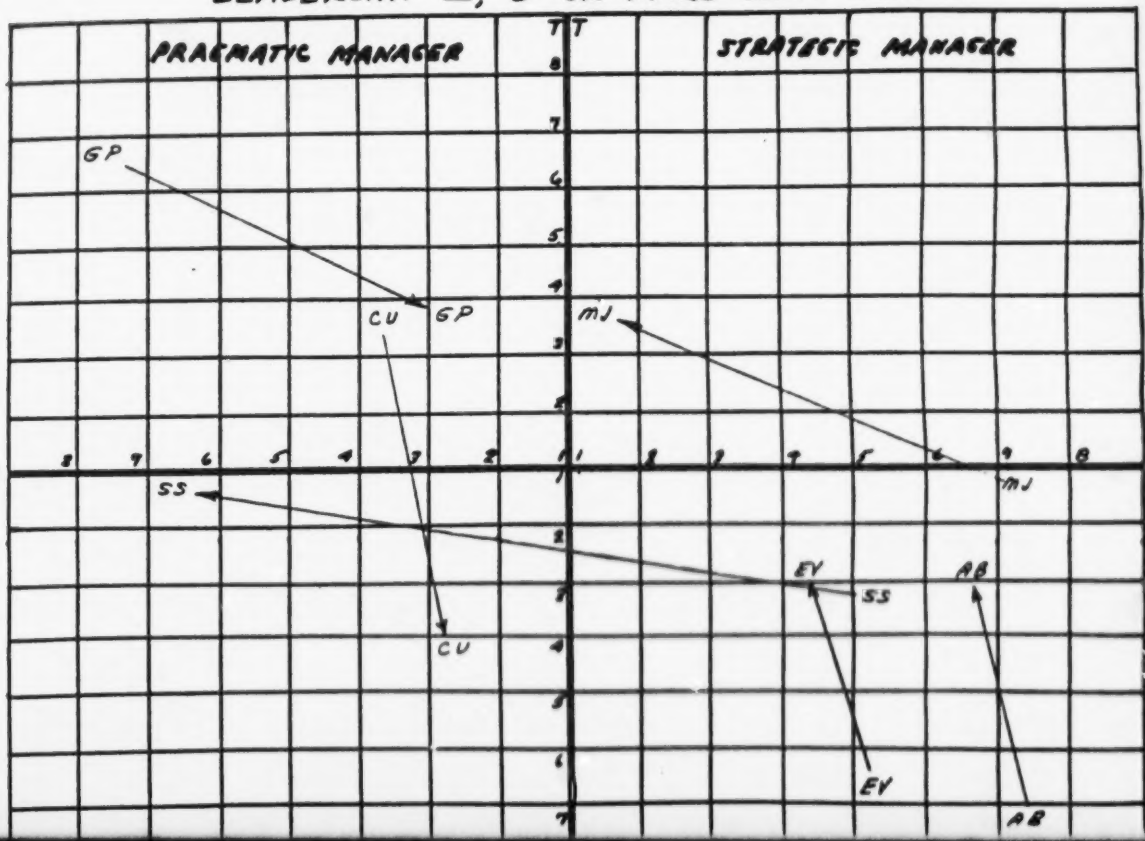
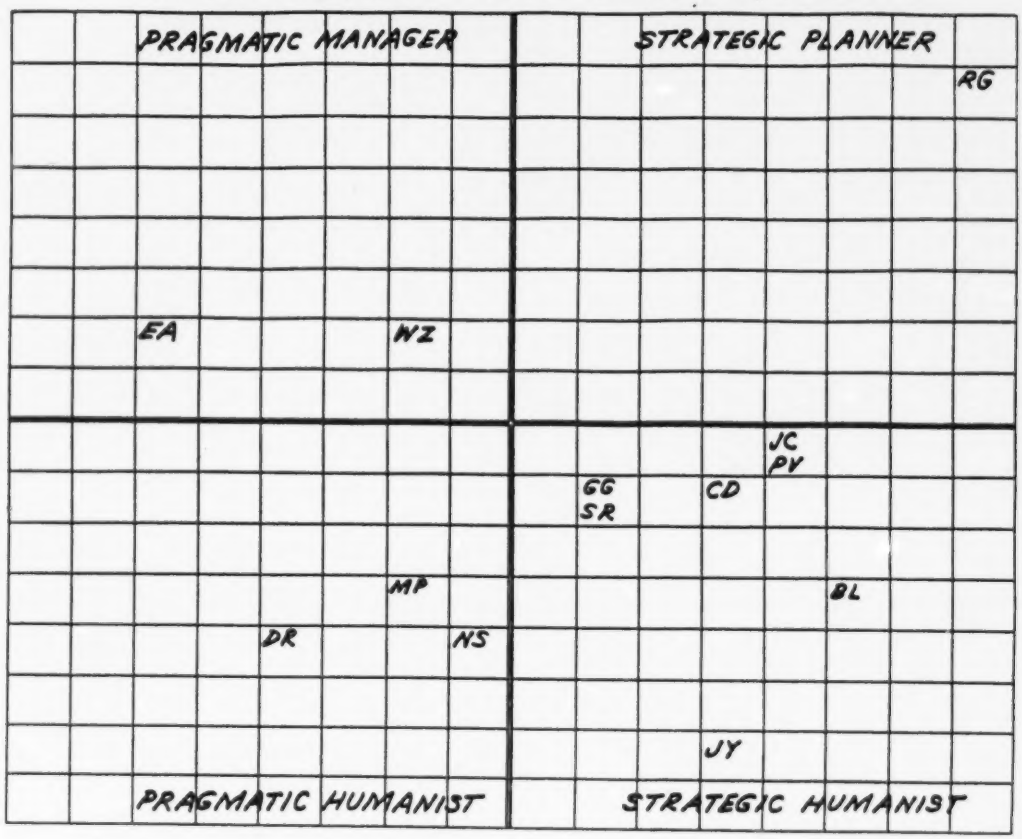
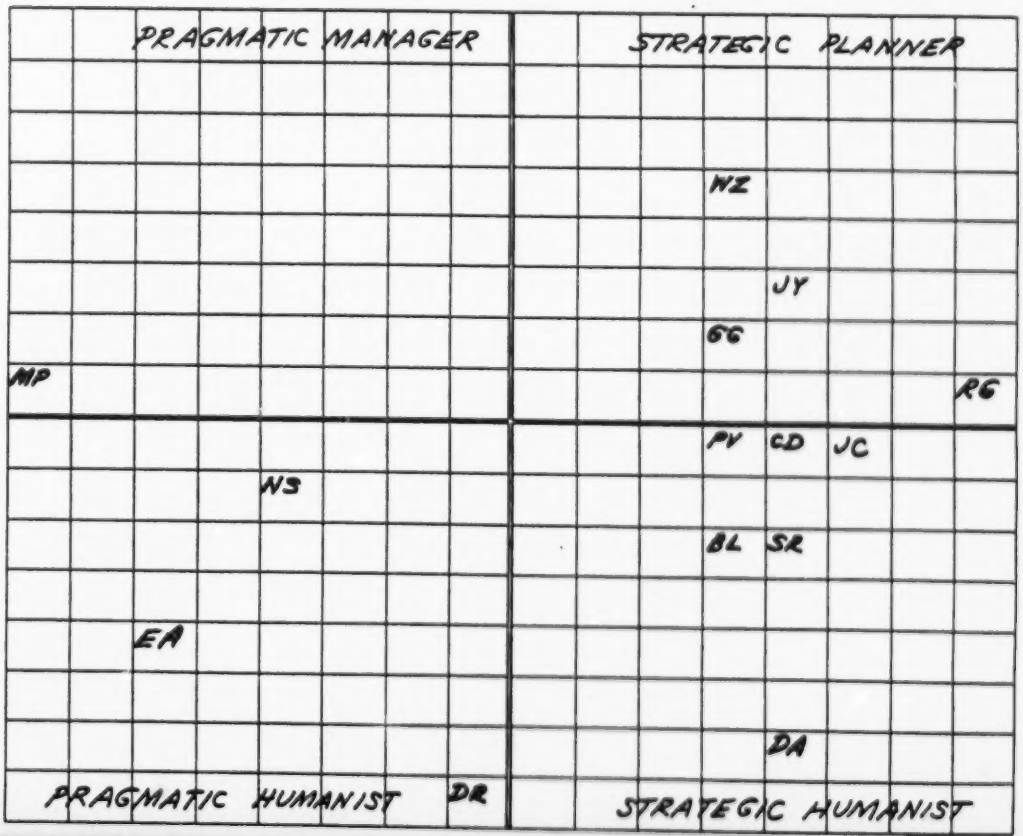


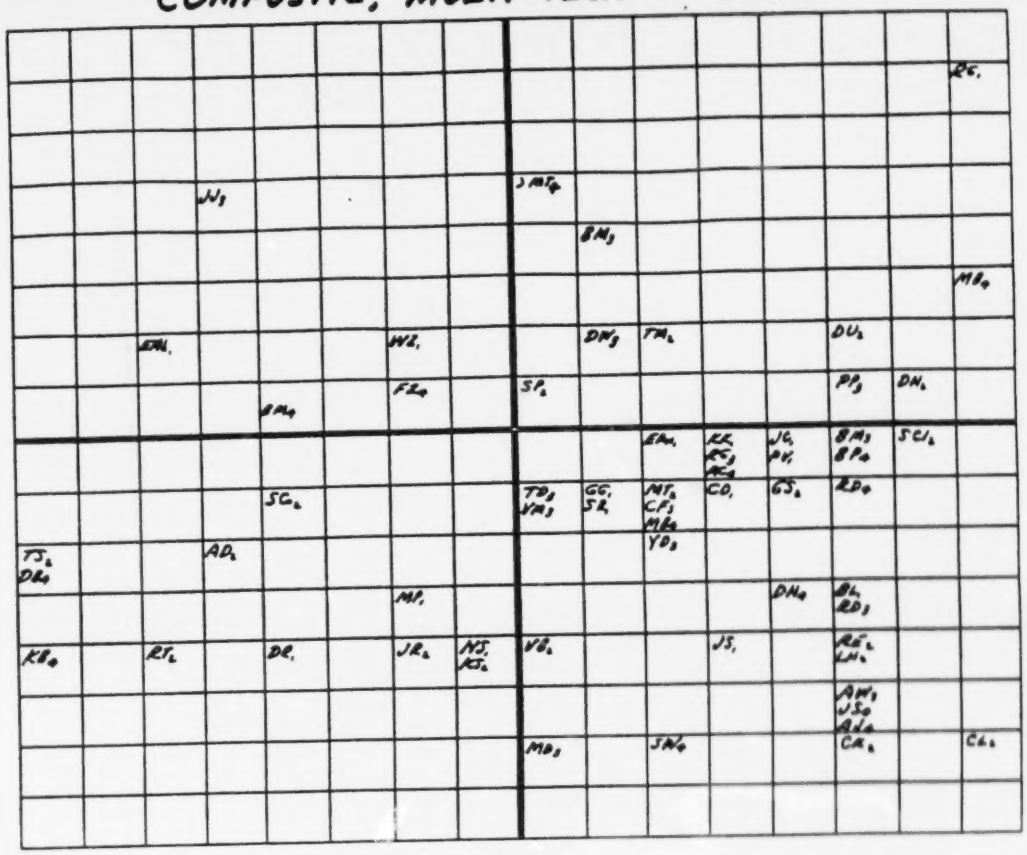
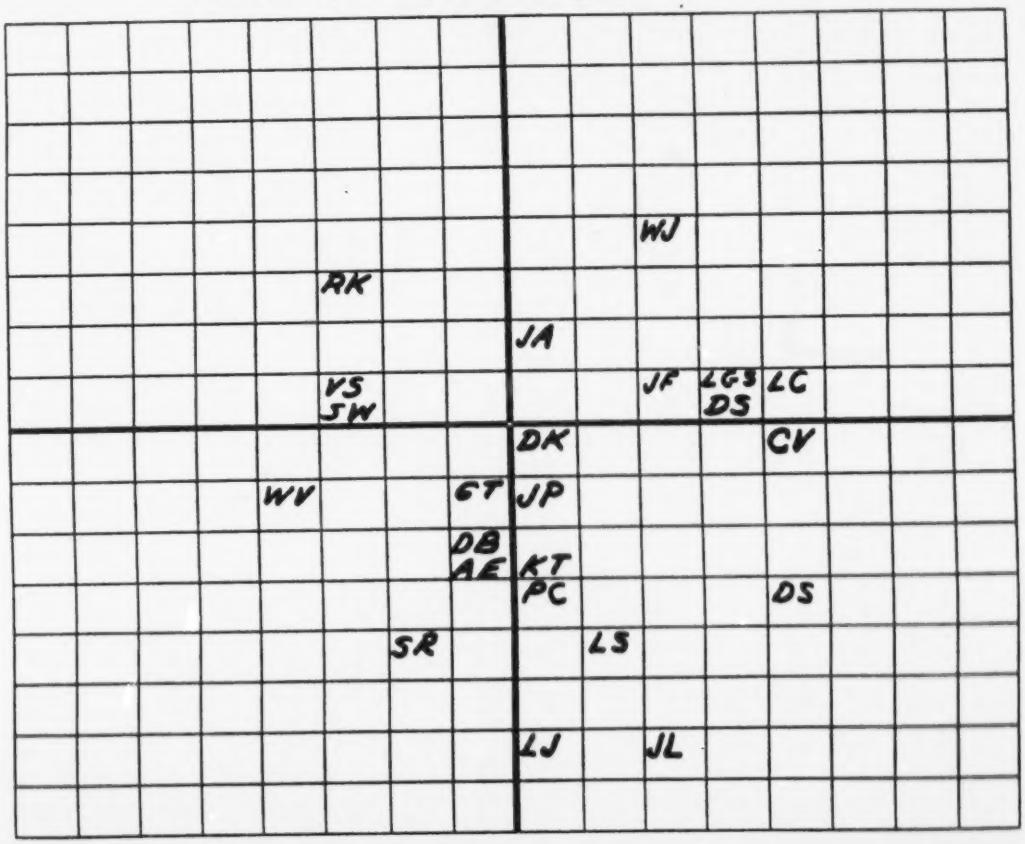
NATIONAL (MULTI-TECH) CLUSTER I, FEB 1991



NATIONAL (MULTI-TECH) CLUSTER I OCT 1993



COMPOSITE, MULTI-TECH CLUSTERS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